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AUTHOR	Byers, Bruce B.; And Others
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ABSTRACT

This report presents a consideration of the state-of-the-art of task analysis or job analysis. The report was developed in connection with the Allied Health Professions Project whose purpose was to provide the data necessary for the development of job-related curricula in training individuals for service in selected allied health occupations. Task analysis or job analysis, as defined in this report, looks at duties, tasks, and elements which make up a specific occupational title; the tasks can then be analyzed to determine the skills and knowledge necessary for performance at a required level of competency, and these skills can then be used to design the required curriculum. This report reviews task analysis methodologies, discusses the need for a usable and practical definition of a unit of work, and then summarizes activities undertaken by the Allied Health Professions Project. Appendixes include a definition of a work unit and further information about the Allied Health Professions Project. (JA)

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EDUCATIONAL PROJECTS, INC.
Pittsburgh, Pennsylvania

Allied Health Professions Project

TASK ANALYSIS:

A REVIEW OF THE STATE OF THE ART

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Bruce B. Byers

Rohn J. Hritz

David J. Lindstrom

June 1973

Frank E. Nowak (Principal Investigator)

Ancillary Project #14-1021

Sarah Mellon Scaife Foundation
and
Commonwealth of Pennsylvania
Department of Public Instruction
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INTRODUCTION

The purpose of the Allied Health Professions Project is to provide the data necessary for the development of job-related curricula for use in training individuals for service in selected allied health occupations. The occupations included in this study are:

(a) Nursing;

(b) Inhalation Therapy;

(c) Radiology Technician;

(d) Clinical Laboratories;

(e) Medical Records;

(f) Food Service;

(g) Hospital Business Office;

(h) Ward Management;

(i) Emergency Medical Technician.

The results of this study are directed primarily toward those institutions which provide "career education" programs; e.g., the vocational and technical schools and the community colleges. Although the results can be applied equally to the hospital-based training program, the trend clearly indicates that the hospital-based program is being phased out. Taking its place is a program of classes held at a vocational school or community college, with a clinical experience being conducted at a local hospital.

Such a phaseout of existing training for allied health occupations

places a great pressure on the vocational schools and the community college system to provide the necessary training for the required number of individuals. In addition, the training program for a community college has the restriction of requiring that the courses be completed in a two-year period, following the normal school calendar. As an example, nursing programs based at the hospital have traditionally been three years in length. Thus, the course of study for a community college must compact the three years of training into the two-year school calendar.

Another problem which must be faced in the training for allied health occupations outside the hospital base is the relative inaccessibility of clinical experience opportunities for the students. In the hospital-based programs, students could become an integral part of the hospital and when such is desirable, clinical experiences could be provided in conjunction with the classroom training. In nonhospital-based training programs, the clinical experience must be provided in one or two large modules.

Also, since much of the training is apart from the work situation into which the student plans to enter, there is a danger that the training can become mainly "academic" in nature. If the training becomes too generalized and deviates too far from the main duties which must actually be performed by the worker, then it will be necessary for the employer (the hospital in this case) to develop an on-the-job training program to provide the entry level workers with the necessary skills and knowledge to perform productively on the job. If this were to become the case, the original transition to a nonhospital-based system would result in a failure.

JOB-RELATED CURRICULA:

Simply stated, the situation described above illustrates the need for an efficient, well-organized training program which is job-related. The program must provide the student with the maximum attainable skill and knowledge in the allowable time. This skill and knowledge must be related to the requirements of the job in such a way that the student will be prepared to enter the profession as a producing member. A training program conducted during the available time cannot afford to deal with skills and knowledge that are not specifically job-related.

If, then, job-related curricula are desirable to efficiently train for the skills and knowledge required for an occupation, one must then ask: what is a job-related curriculum and how does one go about developing such a curriculum? Job-related curricula is, as the name implies, a training program which uses the requirements of the specific occupation or occupational family as the major components of the training program. It may either teach the specific duties required of the occupation, or it may teach more general skills and knowledge which are then transferred to the specific duties which must be performed. For a detailed discussion of these methods, as well as the differentiation between skill and knowledge, the reader is referred to the EPI Allied Health Professions Project Interim Report (November 1972).

In order to develop a job-related curriculum, it is necessary to understand the requirements of the job. Several questions must be answered about the occupation being considered. Among these questions are the following:

(a) What specific duties must be performed by the worker in the occupation?

(b) What steps must an individual go through to perform the duties of the occupation?

(c) What skills, and at what level of the skill, must the individual possess in order to perform each of the duties?

(d) What knowledge is essential to the performance of each of the duties?

(e) What constitutes acceptable performance of each duty?

(f) How do the duties of this job relate to the duties of similar jobs (higher, lower, and of equal status) in the same occupational family, and to other jobs in the field of service (i.e., what occupational lattices and ladders exist)?

Task analysis, or job analysis as it is called in its more general form, provides a tool and a series of methodologies which attempt to answer these questions. In answering the above questions, task analysis provides a mechanism which can be used to provide the data necessary to develop job-related curricula.

Briefly, task analysis looks at the duties, tasks, and elements which make up a specific occupational title. The tasks can be analyzed to determine the skills and knowledge necessary for performance at a required level of competency. These skills and knowledge can then be used to design the required curriculum. Since the curriculum is based entirely upon the data resulting from the task analysis, it will be directly related to the performance

of the job, and thus be demonstrably job-related.

Task analysis can be used not only to develop new curricula or courses of study but also to analyze and validate existing curricula. The reader is again referred to the EPI Allied Health Professions Project Interim Report (November 1972) for further discussion of the creation of new curricula and the validation of existing curricula.

REVIEW OF TASK ANALYSIS METHODOLOGIES

Task analysis, though relatively recent in development, has been the subject of much study. A review of the literature reveals that there exists a cluster of methodologies or techniques which are presented as models for use in task analysis. The techniques or methodologies which have been developed have been collectively referred to as "task analysis" or "job analysis". Unfortunately, there is no such thing as "the" job or task analysis methodology; there are as many methodologies as there are job or task analysis investigations. Each methodology differs in its intent as well as in its level of sophistication or scientific rigor (Gilpatrick, 1972). Each model is dependent upon not only the results desired from the study, but also the occupations which are being studied. However, commonalities do exist among the methodologies. Most methodologies attempt to: (a) identify the kinds of work that are done; and, (b) assess (analyze) that work for its required skills and knowledge. The following steps are included in most methodologies:

(1) A useable and practical unit of work is defined.

Useability and practicality are usually determined by the intent and context of the study (i.e., the purpose and setting

of the study). It is customary to consider a job as being composed of a series of related or unrelated tasks, while tasks are usually considered to be made up of a series of related elements (United States Department of Labor, 1972). Elements are considered to be:

> The smallest step into which it is practicable to subdivide any work activity without analyzing separable motions, movements and mental processes involved. It is a work unit that describes in detail the methods, procedures and techniques involved in a portion of a job (United States Department of Labor, 1965, p. 6).

No matter what unit of work is selected as the unit of interest (job, task, or element), the most difficult problem in defining the unit is to establish the limits of the unit (i.e., setting a "floor" and a "ceiling" on the unit; a beginning and an end). Depending upon the intent or purpose of the study as well as the context of the study, some methodologies are very careful in defining the work unit's limits (Gilpatrick, 1972), and others are not (Barlow, et. al., 1971).

In order for the definition to be practical, it is important to consider if the final definition is operational, given the kind of situation in which the definition is to be applied.

(2) Applying the definition of a work unit in a specific situation. Once the work unit has been satisfactorily defined, it is used to identify or locate specific units of work in a particular setting of interest. The definition can be applied or work units can be located by:

(a) directly observing the performer or worker (Gilpatrick, 1972; Klaus, Gosnell, Reilly, and Taylor, 1968; Lanham, Herschelmann, Weber, and Cook, 1970);

(b) interviewing the performer, the performer's supervisor or an incumbent performer (Gilpatrick, 1972; Lanham, Herschelmann, Weber, and Cook, 1970; Ramsey, 1971); and,

(c) intuition on the part of incumbents or experts in the specific work area (United States Department of Labor; Barlow, et. al., 1971).

Most methodologies utilize a combination of the procedures depending upon their applicability to the specific situation.

(3) Recording the specific work units.

Once the definition has been applied in a specific work situation, the work unit must be recorded. The unit can be recorded by:

(a) adherence to a strict sentence structure, i.e.:

i. the implied subject of the sentence is the performer;

ii. the verb is an "action" verb describing the work behavior done by the performer;

iii. the object of the verb describes the subject (people, data, or things) to which the action is directed; and,

iv. an infinitive phrase which explains the purpose of the action (United States Department of Labor, 1972). For example, "Operates and controls coal dryer and auxiliary equipment to dry coal." (United States Department of Labor, 1972, p. 7).

(b) a modified paragraph or sentence structure; e.g., "Removing a patient's sutures using antiseptic, clamp, scissors, forceps; evaluating healing; deciding on ordering antibiotics, medication, irrigation, and/or bandaging; recording on patient's chart" (Gilpatrick, 1972, pp. 3-5).

(c) utilizing a specific organizing structure; e.g., a flow chart or PERT network (Lanham, et. al., 1970) or a sequencing chart (i.e., organizing and recording the work behaviors so that they conform to a set pattern or structure such as a preparation, execution, and termination stage of a work unit) (Klaus, et. al., 1968).

(d) a phrase or clause form following no strict structure (Barlow, et. al., 1971; Ramsey, 1971), e.g., "Takes readings."

No matter which recording procedure is selected, consideration should be given to:

(a) the use of a standardized vocabulary (Lanham, et. al., 1970) to minimize misunderstanding about describing what the performer is doing (i.e., operates means the same thing to all judges).

(b) assuring that the recording procedure indicates the limits of the unit in order that there is no misunderstanding about what activities or actions the unit encompasses.

(4) Assessing the unit of work for its required levels of skills and kinds of knowledge.

Once the work unit is precisely recorded, it is usually assessed to determine its required skills and knowledge. (Note: it is not the performer of the work unit that is assessed, it is the unit itself). It is worthwhile to note that the different methodologies do not agree on the definition of skills and/or knowledge. Some methodologies are very careful in defining skills and knowledge, others are not. A work unit can be assessed for its required skills by:

(a) rating it on selected skill scales; e.g., Gilpatrick (1972) developed equal-appearing interval, or Thurstone-type, scales for such skills as manual skills (locomotion, object manipulation, and guiding and steering), interpersonal skills (human interaction and leadership), language skills (oral, reading, and written use of language), decision-making skills (decision-making on methods and decision-making on quality), and intellectual skills (figural skills, symbolic skills, taxonomic skills, and implicative skills). Such a procedure allows skill levels to be determined for specific work units.

(b) categorizing the work behaviors as to their relationship with <u>data</u> (i.e., if the unit requires synthesizing, coordinating, analyzing, compiling, computing, copying, or comparing of data), <u>people</u> (i.e., if the unit requires mentoring, negotiating, instructing, supervising, diverting, persuading, speaking-signaling, serving, or taking instructions-helping),

or things (i.e., work behaviors indicating setting up, precision work, operating-controlling, driving-operating, manipulating, tending, feeding-offbearing, or handling) (United States Department of Labor, 1972).

(c) by obtaining factor structures from rating indicating the importance of certain behaviors to the job; e.g., Ramsey (1971) obtained factors such as cognition-data gathering and action-taking, manual activity-tools or objects, numerical ability, literacy and simple arithmetic, near three-dimensional spatial visualization, memory, measurement, and writing.

(d) by intuition on the part of incumbents or experts; e.g., Klaus, et. al. (1968) examined work units to make certain determinations, such as "knows how to schedule treatments in order to avoid prolonged patient contact," (p. A-37).

In addition, work units have been assessed for such things as the physical demands required to do the job; i.e., attributes such as strength required, climbing or balancing, stooping, kneeling abilities, etc. (United States Department of Labor, 1972).

(5) Gathering performance data related to those performing the unit of work.

Some methodologies stop at recording the specific work units, while others define a unit of work, apply the definition of a work unit in a specific situation, and record the specific work units in

order to obtain assessment of the unit of work's required levels of skills and kinds of knowledge. Those methodologies which are concerned with gathering performance data for the units usually construct a work unit inventory (Barlow, et. al., 1971). The inventory is then administered by observation, interview or questionnaire to a sample of performers in order that the identification, location, and performer of work units can be determined (i.e., as a check on the initial identification and location procedure).

(6) Using the data gathered from the study.

Most job or task analysis methodologies use the unit of work information or data (e.g., the skills ratings) to produce useable inferences. The use of the data is dependent upon the purpose or intent of the study. Data resulting from a job or task analysis has been used to:

(a) construct precise and accurate position descriptions (United States Department of Labor, 1972);

(b) restructure jobs or reallocate specific work assignments (United States Department of Labor, 1972);

(c) validate existing testing devices and other employment criteria (Ramsey, 1972);

(d) construct job ladders and lattices (Gilpatrick, 1972);

(e) analyze existing curricula (Gilpatrick, 1972; Barlow, et. al, 1971; Lanham, et. al., 1970; Educational Projects, Inc., 1972);

(f) build or construct new curricula (Lanham, et. al., 1970);

(g) establish work procedures (Klaus, et. al., 1968); and,

(h) provide information for management (Manpower Management Institute, 1972).

THE NEED FOR A USEABLE AND PRACTICAL DEFINITION OF A UNIT OF WORK

From the existing methodologies, it is clear that it is important that a workable definition of the unit of work to be used be developed. Such a definition should be:

(1) Applicable across the different kinds of health delivery systems: e.g., prehospital, clinic, hospital and physician's office. In each type of delivery system, similar as well as dissimilar kinds of work exist. Thus, the definition cannot be "specific" and must be applicable across all the existing systems.

(2) Applicable across different occupational families as well as across different occupational titles within a given occupational family. Past studies (Barlow, et.al., 1971; Educational Projects, Inc., 1972) indicate that the same work might be done by Registered Nurses, Licensed Practical Nurses, and Nurses Aides, as well as by Inhalation Therapists and Ward Managers. Thus, the same work unit had to be recognizable within and between occupational families (i.e., it had to be sufficiently self-contained to be evident in different performing situations).

(3) Sufficiently self-contained so that it would provide the possibility of being used to construct or build meaningful job ladders and

and lattices.

(Note: The above three criteria suggested that it is necessary to carefully stipulate the limits of the work unit. That is, it is necessary to know exactly what behaviors the specific work unit encompasses.)

(4) Reliably used and applied (i.e., two or more independent observers or judges looking at the same unit of work being performed should recognize and record the unit in the same way as well as agree on the specific unit's existence and limits).

(5) Applicable for recognizing the same work unit being performed by different procedures. Experience indicated that the same work might be performed differently by some personnel, but would still result in the same accomplishment.

(6) Meaningful (i.e., for allowing rather complex skills to be assessed). The work unit had to be so defined that it would detect the utilization of some unobservable, but essential, work behaviors.

(7) Applicable in situations where more than one performer was engaged in the completion of a specific unit of work (i.e., much work in health care is performed by teams of individuals).

In summary, in order to guarantee applicability of the Allied Health Professions Project, the definition of a work unit should reflect the following characteristics:

(1) the definition should set limits on the work; i.e., the work unit should be sufficiently self-contained;

(2) the definition should make it possible to identify work which might overlap across and within occupational families, as well as across the different types of delivery systems;

(3) the definition should be reliably applied by independent observers or judges;

(4) the definition should make it possible to identify the same work unit even though different performers may use different procedures in different settings to accomplish equivalent ends; and,

(5) the definition should make it possible to include the work performed by co-workers.

Gilpatrick (1972) reviewed the definitions of Miller (1966), Verdier (1960), Air Force (1961), Department of Labor (1970), Fine (1969), Jackson (1971), and Klaus, Gosnell, Chowla, and Reilly (1968). Gilpatrick concluded that most, if not all, of the existing definitions lacked replicability, applicability, and failed to set useable and workable limits of the work unit. It was also noted that most existing definitions do not give enough consideration to the observation and recording of alternative procedures for accomplishing the work or do not allow some unobservable behaviors to be recorded or fully considered. The lack of applicability caused Gilpatrick (1972) to develop another definition of a work unit. Gilpatrick's (1972) identification criteria and task definition are as follows:

> The task is a unit of work which is smaller than that of a job as a whole or, in most cases, than that needed to produce an entire product such as a health service or a manufactured item. The task reflects individual work activities which, in many cases, will be steps leading to or assisting in the production of a final product. The task relates to the performer's <u>output</u> rather than the institution's product (products are the units which are sold).

The task is composed of elements. The element is smaller than the task and is involved in defining the task. The elements of a task are the smallest possible meaningful units of work resulting from physical and/or mental activity. In contrast with tasks, elements do not have identifiable, useable outputs which can independently be consumed or used, or which can serve as an input in a further stage of production by an individual other than the performer. A task is identified as follows:

1. The output of a task is the result of an independent stage in a production process in the context of the current organization of work activities in the institution.

2. "What is used" in a task includes: all the things which the performer is expected to be able to use or choose from to produce the identified output.

3. The kind of recipient, respondent, or co-worker involved in a task reflects the characteristics or conditions of the persons involved which determine the knowledge needed on the part of the performer in dealing with them.

4. Individual tasks are identified through the combination of information on output, what is used, and the recipient, respondent or co-worker in a manner compatible with the task definition. Individual tasks are differentiated or judged to be duplications or overlaps of each other based on their data.

A task is a series of set of work activities (elements) that are needed to produce an identifiable output that can be independently consumed or used, or that can be used as an input in a further stage of production by an individual who may or may not be the performer of the task. The definition is further elaborated as follows:

1. In principle, someone other than the performer of the task must be able to use or consume the output of the task.

2. Theoretically, it should be possible for there to be an elapse of time between tasks.

3. A task includes all the possible conditions or circumstances which a single performer is expected to deal with in connection with a single production stage.

4. A task includes all the elements that require continuous judgment or assessment by the same performer in order to assure the quality of the output.

5. A task includes all the elements needed to produce an output which can be independently used or acted upon without special explanations to the next performer in the next stage of production.

6. A task includes all the elements needed to complete an output to a point at which another performer (who would continue with the next production sequence) would not have to redo any elements in order to continue.

7. A task includes all the elements needed to complete an output to a point at which another performer, in order to continue with the next stage of production, need not perform extra steps.

8. The task must not require that, for another performer to continue with the next stage in a production sequence, current institutional arrangements would have to be changed.

9. A task must be sufficiently broad in statement that it can be rated on its frequency of occurence.

10. Two tasks are the same if their elements result in the same output, require the same things to be used (including the alternatives to be chosen among what is used), and if the kind of recipient, respondent or co-worker involved is the same in terms of what the performer needs to know in order to deal with the person (Gilpatrick, 1972, pp. 3-1 -- 3-3).

Although Gilpatrick's definition is an improvement over previous definitions with respect to its consideration for providing precise limits on the work unit, for providing for the inclusion of alternative procedures and for allowing for the recording of unobservable behaviors, it is not exactly clear what is meant by "independently useable," restrictions on co-workers, and assessment of quality by the performer (i.e., these terms are not adequately defined and as such there is some ambiguity about the limits of the work unit).

In order to "tighten up" Gilpatrick's definition, it was determined that additional consideration be given to the following concepts:

(1) Work Unit Limits: It is felt that by carefully defining "independence" some of the ambiguity about work limits would be mitigated. Further, the ambiguity about limits could also be mitigated by precisely defining the:

(a) responsibility of a single performer; and,

(b) restriction on involved co-workers.

(2) Continuous Judgment or Assessment by the Same Performer: It is felt that additional consideration should be given to judgment or assessment of work quality by the performer or an involved co-worker of the specific work.

In order to obtain some insight into these problem areas, additional unit of work definitions were reviewed.

The United States Department of Labor (1972) slightly modified their 1965 definition and included a section on determining job limits, as well as including a section on the arrangement of tasks:

> Generally, in describing the tasks that comprise a job, the analyst should arrange them in either a chronological or a functional order. Tasks are usually arranged functionally when a job has no regular cycle of operations....
>
> Basically, every job analysis should represent a description of one job -- no more and no less. Tasks temporarily assigned to a given worker in addition to his regular duties should not be considered part of the basic job. The following are the kinds of situations which the analyst encounters in job analysis studies.
>
> 1. The worker performs a specific cycle or sequence of operations .... For example, tasks for some machine

operating jobs may be arranged in the following order: (1) sets up machine; (2) operates machine; (3) removes workpieces; (4) maintains tools; and (5) maintains machine....

2. The worker has no regular cycle of operations. This situation is usually more difficult to analyze since it frequently involves a considerable variety of tasks. The analyst should organize the information according to function....

3. The worker frequently changes from one set of tasks to another .... The workers frequently change about to relieve monotony. The tasks should ordinarily be analyzed collectively and recorded on one job analysis schedule, since the tasks involved, although performed by individual workers, actually constitute one job, all phases of which are performed by all the workers.

4. The worker performs a given set of tasks although in emergencies he performs other sets of tasks involved in other jobs. For example, in an aircraft factory a group of workers are known as fuselage frame builders, rib frame builders, and spar builders. The workers are engaged in framework assembly. Each assembles various members of a unit fuselage, wing, rib, or wing spar in a jig, and then temporarily secures the assembly with screws, bolts, or task welds prior to final riveting or welding operations. Although the jobs are interchangeable to the extent that any one of the workers performs the duties of any one of the other in emergencies, each worker performs his respective job in regular production work. (p. 3-4).

The concept of perceiving a work unit as a sequencing of steps or stages seems to be a reasonable way to establish limits on work units. In addition, situations 2, 3, and 4 above seem to indicate that it is worthwhile to consider the possibility of placing restrictions on co-workers and the main performer by establishing criteria to handle the contingencies presented in the situations (i.e., when is a work assignment considered the responsibility of the performer, and what and how much help can he receive from a co-worker?). The definition used in the current study uses the situations presented above to expand on the

work restrictions of the performer and involved co-worker cited in Gilpatrick's definition. Further, the possibility of sequencing work behaviors leads to the definition developed by Klaus, et. al., (1968):

> A task or "activity" ... was defined in terms of what was to be accomplished by it. And, because each accomplishment necessarily involved several steps, an "activity" was regarded as including all the steps involved from its instigation to its completion. Thus, preparing for or recording an activity was made part of the activity ... (p. 7).

Later the sequencing steps are specified:

> The sequence of steps belonging to each activity was divided into four "stages": preparation, execution, follow-up, and recording. The "preparation stage" refers to all those steps which precede or lead up to the main performance (i.e., assembling equipment, preparing the patient). The "execution phase" includes all those steps which comprise the major intention or purpose of the overall performance (giving an enema, exercising the patient). The "follow-up stage" is comprised of those steps which follow the completion of the activity (cleaning equipment, checking a patient following treatment). The "recording stage" consists of entering appropriate information on a patient's chart and/or record (p. 9).

In addition, the definition developed by Lanham, et. al., (1970) develops a procedure of sequencing work actions. Lanham, et. al., (1970) categorizes tasks as basic, secondary, special, advanced, and ancillary; only basic tasks are broken into their steps. Basic tasks are defined as:

> tasks which constitute the central purpose or mission of the job. These tasks will be described in detail as to conditions, contingencies, steps, and (as possible) success criteria. These tasks must be mentioned as being most important and/or most time-consuming by the employee and/or the supervisor ... (p. 19).

Later the steps are specified:

> the steps of performance ... are arranged in three major divisions (1) acquisition, i.e., the source or sources of or materials on which the task is to be performed; (2) process, i.e., the sequence of actions taken by the worker to perform the task; and (3) disposition, i.e., what the worker does with the product or output

generated (p. 55).

Modifications of the definitions developed by Klaus, et. al., (1968) and Lanham, et. al., (1970) are used in the current study; i. e., the staging or sequencing of work behaviors into steps is used as a method for placing limits on the work units, as well as providing a means for including non-tangible aspects of work activities. For example, each work unit must have an evaluative stage, a stage which contains work actions which indicate how the output generated from a work unit is evaluated as acceptable or not, even when there are no independent and established criteria to assess the behaviors necessary to accomplish the work unit. The United States Department of Labor (1972) definition is used to establish useable restrictions on a single performer and an involved co-worker. The unit of work definition developed based upon the above is given in Appendix A.

SUMMARY OF ACTIVITIES UNDERTAKEN BY ALLIED HEALTH PROFESSIONS PROJECT

A. The Initial Study

The task inventories developed by the UCLA Allied Health Professions Project (Barlow, et. al., 1971) were used as an initial starting point for the EPI study. Eight (8) of the inventories were distributed to a sample of hospitals for a three-county pilot survey (Allegheny, Westmoreland, and Beaver Counties). The survey data was then summarized and the performance data analyzed, with the results being reported in the EPI Allied Health Professions Project, Interim Report (April 1972).

The pilot survey resulted in the identification of difficulties with the UCLA task inventories. In their existing form, these inventories could not be

used as a basis for development and/or verification of curriculum. Among the problems encountered with the inventories were:

(a) task statements were constructed in a way that made it difficult to determine the limits of the task;

(b) some task statements were worded in such a manner that they were misinterpreted by respondents;

(c) many task statements were related to another in that some statements were actually elements of a larger task which may or may not have been a part of the inventory;

(d) many task statements included in the inventory were statements of things done by performers which had little or no relationship to any skills and knowledge required by the occupation, e.g., "Run errands";

(e) the level of involvement of the responding worker could not be determined from the response to tasks statements such as "Assist with individual and group therapy, ..."; and,

(f) separate inventories existed for Nursing, Inhalation Therapy, and Ward Management when in actual practice the duties of these occupations are not always performed by separate groups or occupations.

In addition to the problems encountered with the task inventory used by the UCLA project, a difficulty with the methodology appeared as well. The UCLA project provided no procedures for the translation of the data obtained

from the task survey to information which is useable in the development of curriculum. Thus, there existed no method by which one could determine the required type and level of skills and knowledge which could be used to determine the amount of training necessary to enable the individual to perform the task.

However, even with the many problems stated above, the UCLA task inventories were invaluable in that they provided EPI with a reasonable starting point for the current project. The statements, though inadequate, provided a base upon which a more adequate task inventory could be built. The survey instrument used by UCLA provided a base for the development of a more comprehensive form. The method of analysis of data used by UCLA was of assistance in designing the analysis methods used in the current project.

B. The Use of Task Analysis to Validate an Existing Curriculum

The task inventory for the occupation of Radiologic Technology was modified and used to validate an existing curriculum for training Radiologic Technologists.

The specific curriculum used in this validation was the curriculum and course outlines recommended by the American Society of Radiologic Technologists in the publication, Curriculum and Teachers' Syllabus for Schools of Radiologic Technology.

Each of the tasks in the inventory was analyzed to determine the necessary skills and knowledge for performance. The curriculum and course outlines were then consulted to determine if and where these tasks or their requisite skills and knowledge are taught. The results of this analysis are presented, and discussed fully, in our Interim Report of November 1972.

C. The Use of Task Analysis to Develop New Curricula

Task analysis can also be used to develop new job-related curricula. The method which can be used involves the analysis of each task to determine the elements, or steps, which are involved in performing the task. The elements are grouped according to the stages:

(a) preparation;

(b) execution;

(c) evaluation; and,

(d) follow-up.

Each of the elements is stated in such a way that the required type and level of skill and knowledge are precisely given. The skills and knowledge can then be either rated (e.g., using the rating scales developed by Gilpatrick, 1972), or one can determine by inspection that level of skill or knowledge which is the highest for a given type of skill or body of knowledge. The highest level noted for each type of skill is that level which must be attained by the student. The same is true for each body of content knowledge required. If all elements are rated, the hierarchy of rating can provide a guide for introduction into the training program of specific tasks or elements. Further discussion of this subject, including examples of tasks which have been analyzed to obtain the elements, can be found in the EPI Interim Report (November 1972).

D. The Construction of Task Inventories

Using the task inventories of the UCIA project as a base, new task inventories were constructed. These inventories were built using the following criteria:

(a) application of the unit of work definition;

(b) inclusion of only those tasks which require that a skill and knowledge be taught;

(c) grouping tasks which might be included within an occupational title in a hospital as was the case in the grouping of Nursing, Ward Management and Inhalation Therapy; and,

(d) clarifying the response options in order to establish the involvement of the worker and other co-workers (if any) in performing the task.

Six (6) inventories were constructed using the UCLA inventories as a base. A seventh inventory was constructed for the occupation of Emergency Medical Technician. This occupation was not included in the UCLA project, and thus required that the complete inventory be created using interviews and observations of individuals currently working in the field.

Respondent background questionnaires were developed. These questionnaires are being used to obtain specific personal data such as age, years in the occupation, level of training, and certifications held. The responses to this data can be compared to the actual performance responses and grouped to determine if specific relationships exist between such items as years in the occupation, level of training or occupational title, and the performance of specific tasks or groups of tasks.

A complete questionnaire currently in use (Emergency Medical Technician) and task lists for the other six (6) groups to be surveyed are included in Appendix B.

E. The Statewide Survey

A statewide survey to gather data on the task performance is currently being conducted. The survey is divided into two phases: the first phase involves gathering data on the nonhospital-based occupation of Emergency Medical Technician; the second phase is directed to the other six (6) occupational groups which are hospital-based. The first phase is underway with approximately 50 ambulance services and 300 performers participating. The second phase will involve 25 to 30 hospitals with approximately 200 respondents/occupations. The results of these surveys will be produced in a series of reports. Each report will discuss one (1) occupational group.

F. The Need for Training Programs in Specific Occupations

Although not directly related to the use of task analysis to develop job-related curricula, it is recognized that another step is necessary in the process: that of determing if, in fact, a demand for a training program exists. This step should proceed any task analysis effort to develop training, because it is illogical to create a job-related training program when little employment opportunity exists for the trained individual.

As a part of the Allied Health Professions Project effort, a pilot labor market study for selected allied health occupations was conducted in the City of Philadelphia. Admittedly, the study was not comprehensive, however, the purpose was merely to indicate the direction which such a study might take and to provide a relatively unsophisticated and low-cost method to estimate labor market demand. A report on this pilot effort is included in Appendix C.

Of particular interest in this study were a number of "emerging" occupations for which specific training programs do not currently exist. If a demand

for such occupations exists, the next logical step to take is to perform a task analysis on the occupations to determine what the worker does. The results of this analysis can then be used to build the curriculum and course content outlines.

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APPENDIX A: DEFINITION OF A WORK UNIT

APPENDIX A

DEFINITION OF A WORK UNIT

The definition of a work unit used in the present study is an extension of Gilpatrick's (1972) definition using modifications of the definitions and concepts established by Klaus, Gosnell, Reilly, and Taylor (1968); Lanham, Herschelmann, Weber, and Cook (1970), and the United States Department of Labor (1972).

The work unit is defined as:

> A series of four stages each being composed of a set of related work activities (or elements) that are unconditionally (and usually independently) useable and usually generated by a single performer given the restriction of an involved co-worker.

The definition is further clarified by:

(1) Work activities are defined as: the smallest work actions into which it is practical to subdivide any work behaviors without considering separate motions and/or movements.

(2) The work unit must be large enough to contain a preparation, execution, evaluation, and disposition stage.

   (a) The preparation stage contains those work activities which lead up to the main performance; e.g., it is a getting "ready" of materials, preparing of equipment, etc.

(b) The execution stage includes those work activities which make up the major purpose of the unit; i.e., it is the "doing" of the work unit, the "essence" of the unit.

(c) The evaluation stage is composed of those work activities which are performed to establish the acceptability of the output as well as those work actions making up the unit (e.g., comparing the output to some pre-established standard).

(d) The disposition stage is composed of those work actions which end the unit, the returning of equipment to a state of neutrality, (e.g., cleaning equipment, putting away all unused material, recording the completion of the unit). In sequence, the evaluation stage may happen after the disposition stage. There usually should be more than one work activity within each stage. If there is one and only one work activity within each stage which is purely descriptive of physical movements or motions, then the unit of work may be too small; i.e., the unit must be sufficiently broad enough so that it can be rated on its frequency of occurrence; physical movements alone may be too small to accurately rate on frequency of occurrence.

(e) In principle, someone other than the main performer and the involved co-workers, if any, must be able to use the output either directly or in other sequences of productions. (See 4, below for the criteria of unconditionality).

(4) The work unit must be small enough to include only those stages and work activities which are often done by a single performer, given the following restrictions of an involved co-worker, if any:

(a) If an involved co-worker does any one stage completely, then both performers can be considered responsible for the generated output, if and only if the main performer could and often does the stage himself.

(b) If an involved co-worker does any one stage completely, then it may be possible to consider the stage as a meaningful unit of work for the involved worker, if and only if the work unit meets the demands of the definition (i.e., if it is large enough to involve the four stages, meets the restrictions of involved co-workers and meets the requirements of an unconditional and useable output). This condition or situation demands that the involved initial co-worker's output be used only in other sequences of production.

(c) If an involved co-worker (or group of involved co-workers) participates in any or all stages (but not completely), then the output generated is the responsibility of all workers, if and only if the main performer could and often does perform those work activities completed by the co-workers.

(d) The unit includes all those work activities that require continuous judgment or assessment by the same main performer in order to assure the quality of the work and the output.

(5) The output of the work unit is unconditionally useable if and only if it meets the following conditions:

(a) All the stages and work activities needed to generate an output which is directly consumable or used in other sequence of productions by another performer or set of performers must usually be complete and independent; that is, without the conditions of having other performers or the user:

i. redo any of the stages completely;

ii. redo any of the work activities contained within any work stage;

iii. do any extra or additional work activities; and,

iv. in need of special explanation.

(b) If the other performers in (a) make the conditional output complete and useable then they are responsible for the generated output, if and only if the other performers are not the original performers (main performer and involved co-workers), i.e., a unit of work cannot generate a conditional output.

(c) "Usually" (a) refers to the customary procedures of the system in which the output is generated.

(6) Theoretically, and practically, it should be possible for there to be an elapse of time between work units.

(7) Two units of work are the same if their stages and contained work activities result in the same output, require identical things to be used, and if the kinds of co-workers involved are the same in terms of what the performer needs to know in order to deal with the unit and people involved in the unit. Notice that the outputs are identical but the work activities need not be identical (i.e., they may include alternative ways of doing work and alternatives among what is used, etc.).

Work units can be identified by:

(1) The output of the work unit given in which it was generated and the stipulated conditions in the above definition.

(2) What is used during the production of the output at all stages (i.e., what machines, tools, work aids, and equipment) as well as other things which the performer is expected to be

able to use and/or choose from to generate the output.

(3) The kind of co-worker involved as well as the amount of work accomplished by the co-worker in the completion of the unit.

Work units are identified by combining information from all three of the above items in an effort to determine conformance to the definition. In addition, work units are differentiated based upon the variables expressed in the definition.

DEMONSTRATION OF THE APPLICATION OF THE UNIT OF WORK DEFINITION

The tasks inventory constructed by Barlow, et. al. (1972), (UCLA tasks inventory), was developed and written by experts and incumbents. No recording rules were specifically utilized and the tasks were recorded as sentences or phrases. The sentence or phrase structure has several inherent limitations:

(1) it does not take into consideration the limits or size of the work unit (i.e., the sentence structure does not indicate when the work unit begins or ends);

(2) it does not take into consideration the steps or stages involved in completing the work unit (i.e., the sentence structure does not indicate all that is encompassed in completing the work unit); and,

(3) it does not take into consideration the smaller work actions (or elements) involved in completing the individual stages (i.e., each stage has specific work elements required to complete the work stage).

Thus, the UCLA inventory has recorded tasks at all levels and all sizes; some of the statements are stages of a larger work unit, while others are only elements of a given stage. The problem is that the UCLA task inventory records each as a separate sentence or statement. This generates the following kind of problems:

(1) the inventory is too lengthy, since it disregards the basic structure of a work unit; and,

(2) it becomes confusing, since the different levels are not necessarily organized by the basic structure of a work unit.

These problems made it necessary to develop a definition of a work and to establish rules for recording the task. The definition developed is a modification of the definition developed by Gilpatrick (1972); the United States Department of Labor (1972); Klaus, Gosnell, Reilly and Taylor (1968); and Lanham, Herschelmann, Weber and Cook (1970).

Procedure and Example:

In order to develop the task inventory for the study, the UCLA task inventory was extensively reviewed and task statements having the potential to belong to a given work unit were grouped (i.e., statements which were potential work elements or stages to a single work unit were grouped). From the grouped statements, a quasi-unit of work was written following the established unit or work definition. The quasi-unit of work consisted of stringing together statements to:

(1) define the work units' limits, or size;

(2) define the necessary stages or steps involved in the unit (i.e., the preparation stage, execution stage, and disposition stage); and,

(3) if appropriate, work elements were noted.

If stages were missing from the UCLA inventory, then stage statements were constructed and placed in the string in the appropriate location. For example, UCLA records a task labeled, "Plans general menus for patients," the procedure employed enabled the statement to be recorded as:

Plan general menus for patients; gather necessary materials, such as nutrition charts, past menus, menu suggestions; construct menu following specific nutrition guidelines; review menu to see if it meets the specific requirements; and, record or file the menu and communicate the developed menu to the appropriate personnel for changes, modification, or approval.

Although such a statement is lengthy, it:

(1) places limits of the work;

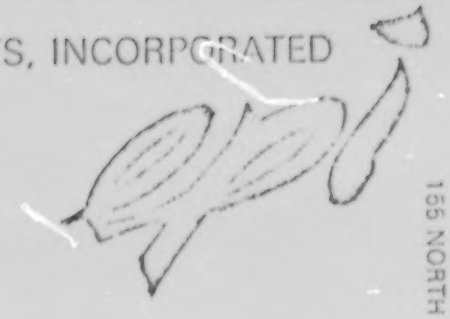
(2) follows a given structure (i.e., the prescribed stages in the definition); and,

(3) eliminates confusion about what is and is not encompassed in the unit of work.

Such a procedure made the UCLA inventory more complete, more organized, and somwehat shorter. In an effort to develop a list of task statements to be placed on a task inventory for use in a survey, the complete units of work were reduced to a brief statement format to which the performer responds.

APPENDIX B: TASKS LISTS

EDUCATIONAL PROJECTS, INCORPORATED



155 NORTH CRAIG STREET, PITTSBURGH, PENNSYLVANIA 15213 (412) 621-4417 Cable Address: EPICS

APPENDIX B

ALLIED HEALTH PROFESSIONS PROJECT

This survey is being conducted by Educational Projects, Inc. (EPI), under a contract with the Pennsylvania Department of Public Instruction, Bureau of Vocational, Technical and Continuing Education, with additional funding by the Sarah Mellon Scaife Foundation. The purpose of this project is to determine what tasks are performed by people providing ambulance service in the state of Pennsylvania, so that those people responsible for developing new training programs will have a more complete understanding of what your job really is. By gathering this type of information, it will be possible to determine if existing training programs are, in fact, related to the job you are doing. The same information may be used in the development of new training programs which meet your specific needs.

None of the forms used in this survey asks for the name of your organization or for the name of any individual attendant. All information gathered throughout Pennsylvania will be grouped together, without regard to where or from whom that information was obtained. It is important that you answer all questions which apply to you and that your answers represent what is really happening in your duties of providing ambulance service.

Without this kind of information, it is not possible to determine if existing and proposed training programs create excessive demands on the trainee or actually meet the needs of the job. The success of this project is largely dependent upon the accuracy of your responses to the "Personal Background Information" sheet and the "Task Inventory".

There are nine (9) blank lines on page #15 of the "Emergency Medical Technician" inventory, which you may use to write in any tasks which may have been omitted.

Thank you for your cooperation.

J. C. WARNER
Chairman of the Board
FRANK E. NOTTAS
President

Consortium Members:
Carnegie-Mellon University
Indiana University
Iowa State University
Northwestern University
Rensselaer Polytechnic Institute
University of Colorado
University of Maryland
University of Minnesota
University of Pennsylvania
University of Pittsburgh
University of Rochester

Washington office: 1717 Massachusetts Avenue, N.W., Washington, D.C. 20036

FURTHER INFORMATION ABOUT THE SURVEY

In an effort to make it easier to complete the survey forms, the following definitions are provided to explain the exact meaning of certain words which have been used.

DEFINITIONS

Definitive medical care - patient care involving measures which often penetrate body integrity; e.g., administration of drugs, administration of intravenous fluids and defibrillation.

Emergency medical care - patient care not involving measures which penetrate the patient's body integrity; e.g., dressing wounds, immobilizing fractures, CPR, administration of oxygen.

Emergency operations center - a central dispatching organization which receives emergency calls (police, fire and ambulance) on a regional basis and acts to coordinate all emergency activities.

Hot line - a direct, private telephone line which connects at least two locations and does not provide communication with any other phone outside the hot line system.

One-way voice radio system - a communication system which consists of a radio receiver/transmitter unit and a radio receiver or monitor which does not have a transmitting capability (e.g., dispatch center to home monitor).

Radius - the longest distance in any direction from the location in which your ambulances are routinely parked to the place in which you provide service.

Two-way voice radio system - a communications system in which each radio unit and base unit has the capability to transmit and receive voice communication from any other unit in the system.

Verbal face-to-face communication - talking to another individual in the same location with no electronic assistance (i.e., telephone, radio system).

Personal Background Information

1. Age ____

2. Sex
   - Male ____ 01
   - Female ____ 02

3. Total years experience in EMS ____

4. Position held (primary title only)
   - Owner ____ 01
   - Manager ____ 02
   - Shift Supervisor ____ 03
   - Crew Chief ____ 04
   - Driver ____ 05
   - Attendant ____ 06
   - Dispatcher ____ 07
   - Clerical ____ 08

5. Number of ambulance trips per month ____

6. Years in this position ____

7. Type of personel reimbursement
   - Non paid volunteer ____ 01
   - Full paid position ____ 02
   - Partial paid position ____ 03

8. If this is a full paid position, in what area were you previously employed?
   - Health Services ____ 01
   - Military ____ 02
   - None ____ 03
   - Other ____ 04

9. Number of individuals you supervise directly ____

10. If you are paid, on what basis?
    - Salary ____ 01
    - Hourly ____ 02
    - Per Call ____ 03
    - Other ____ 04

11. If part time or voluntary, in what area are you presently employed?
    - Health Services ____ 01
    - Manufacturing ____ 02
    - Service Industry ____ 03
    - Education ____ 04
    - Military ____ 05
    - Student ____ 06
    - Retired ____ 07
    - None ____ 08
    - Other ____ 09

12. Registries held
    - EMT ____
    - CIIT ____
    - RN ____
    - LPN ____
    - ARIT ____
    - Other ____

13. If you are not a registered EMT, will you be taking the registry examination within the next year?
    - Yes ____ 01
    - No ____ 02

14. Highest academic level achieved
    - Less than 8 ____ 01
    - 9 ____ 02
    - 10 ____ 03
    - 11 ____ 04
    - 12 ____ 05
    - High School Diploma or equiv. ____ 06
    - Associate Degree ____ 07
    - Some College with no degree ____ 08
    - Bachelors Degree ____ 09
    - Masters Degree ____ 10
    - Ph.D. ____ 11

15. Training received
    - None ____
    - Standard Red Cross ____
    - Advanced Red Cross ____
    - Instructor Red Cross ____
    - CPR American Heart Association ____
    - Extrication Training ____
    - Pa. Dept. of Health Emergency Ambulance Attendent Course; 27 Hour ____
    - 40 Hour ____
    - 81 Hour U.S. Dept. of Transportation course or equivalent (EMT Training) ____
    - Electrocardiography Training ____
    - Infusion of I.V. Fluids Training ____
    - Infusion of Drugs Training ____
    - Advanced Medical Technician; 480 hrs. ____
    - Other Specify: _____ ____

16. If you were offered the following courses, in which would you enroll? How many are available in your area?

	Would Enroll	Are Available
Standard Red Cross	____	____
Advanced Red Cross	____	____
Instructor Red Cross	____	____
CPR American Heart Association	____	____
Pa. Dept. of Health Emergency Ambulance Attendant Course; 27 Hour	____	____
40 Hour	____	____
81 Hour U.S. Dept. of Transp. Course or equivalent (EMT)	____	____
Electrocardiography Training	____	____
Infusion of I.V. Fluids	____	____
Infusion of Drugs	____	____
Advanced Medical Technician; 480 Hours	____	____

17. How many miles would you be willing to travel for training? ____

18. If legislation were proposed that would require at least one EMT (trained at the 80 hour level) be on every ambulance call, how would you probably vote?
    - For such legislation ____ 01
    - Against such legislation ____ 02

EPIAH-01473

EMERGENCY MEDICAL TECHNICIAN Page 1

INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	FREQUENCY: How often do you perform this task?					SKILL LEVEL: To what individual usually involved?			SUPERVISION: How much supervision received			DIFFICULTY: How difficult is this task?			TRAINING: How much skills and knowledge necessary?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or less	Never	You Assist	You are Assisted	Independent Employment	Close Supervision	General Supervision	Little Supervision	Easy	Moderate	Difficult	Limited Training	On-the-Job Training	Considerable Training	Experience
1 Set standard type and quantity of emergency medical equipment needed for unit operation	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
2 Inventory type and quantity of emergency medical equipment to determine need for replacement, resupply, or new equipment	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
3 Place emergency medical equipment in assigned location	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
4 Set standard type and quantity of emergency medical supplies needed for unit operation	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
5 Inventory type and quantity of emergency medical supplies to determine need for resupply or new supplies	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
6 Place emergency medical supplies in assigned location	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
7 Set standard type and quantity of drugs and intravenous (I.V.) fluids needed for unit operation	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
8 Inventory type and quantity of drugs and I.V. fluids to determine need for resupply or new supplies	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
9 Place drugs and I.V. fluids in assigned location	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
10 Set standard type and amount of office supplies needed for unit operation	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

EMERGENCY MEDICAL TECHNICIAN

INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	Frequency: How often do you perform this task?					Autonomy: Is another individual usually involved?			Supervision: How much supervision received?			Difficulty: How difficult is this task?			Training: How much skills and knowledge received?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Equal Involvement	Close Supervision	Periodic Direction	No Supervision	Easy	Moderate	Difficult	General Education	On-the-Job Training	Occupational Training	Experience
11 Inventory type and amount of office supplies to determine need for resupply or new supplies	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
12 Place office supplies in assigned location	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
13 Design emergency medical equipment such as a special splint or vehicle floor plan	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
14 Examine physical facilities to determine need for expansion or construction	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
15 Prepare budget for operation of the unit	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
16 Assign crew and vehicle to respond to ambulance call based upon the nature of the call and personnel available	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
17 Survey type and quantity of emergency medical equipment available for purchase	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
18 Maintain personnel records	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
19 Prepare payroll for unit employees	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
20 Prepare financial report of unit operation	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

EMERGENCY MEDICAL TECHNICIAN

Page 3

INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	FREQUENCY: How often do you perform this task?					ASSISTANCE: Is another individual usually involved?			SUPERVISION: How much supervision is received?			DIFFICULTY: How difficult is this task?			TRAINING: How much skills and knowledge received?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	Yes Assist	No or Assistant Not Available		Direct Supervision	General Supervision	No Supervision	Easy	Moderate	Difficult	Formal Education	On-Job-Training	Both Education & Training	Experience
21 Examine record of service to patient to bill patient for service	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
22 Maintain accounting records	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
23 Maintain records of patients serviced	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
24 Operate a typewriter	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
25 Maintain records of maintenance performed on emergency medical equipment	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
26 Complete information required by special form to report accident	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
27 Complete information required by special form to report ambulance trip (e.g., patient's condition, care rendered, time)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
28 Complete information required by special forms other than those listed above	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
29 Examine record of service to patient to determine charges to patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
30 Record in writing analysis of ambulance trips to determine such things as type of service provided, number of trips per unit of time and average response time	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

EMERGENCY MEDICAL TECHNICIAN Page 4

INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	Frequency: How often do you perform this task?					Do you perform individual usually supervised			Is supervision required?			How difficult is this task?			Should skills and knowledge be learned?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	Yes, Always	Yes, Usually	Yes, Sometimes	Yes, Usually	Yes, Sometimes	No, Never	Easy	Moderate	Difficult	Yes, Before Training	Yes, Before Training, Then Periodically	Yes, After Training	Yes, After Experience
31 Create and maintain on-call roster of staff required to operate unit	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
32 Conduct meetings with hospital representative(s) to coordinate emergency medical services	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
33 Conduct meetings with unit personnel	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
34 Develop policies or procedures to provide guidelines for daily operation of the unit	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
35 Develop an on-the-job training program	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
36 Conduct interview to determine if applicant meets standards for employment	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
37 Administer test to determine if applicant meets standards for employment	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
38 Evaluate unit personnel to determine progress, raises, discipline, and promotion	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
39 Determine staff required to operate unit effectively in any specific time period	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
40 Explain general hospital procedures to patient or family (e.g., admission, discharge, emergency room procedures)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

EMERGENCY MEDICAL TECHNICIAN

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INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	Frequency: How often do you perform this task?					Supervision: Is direct or individual quality assurance?			How much supervision required?			Difficulty: How difficult is this task?			Training: How much skills and knowledge required?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	Yes Assist	Yes Pre Assist	No Assignment	Close Supervision	General Supervision	No Supervision	Easy	Moderate	Difficult	Initial Indoctrination	On-Job-Training	Certificate Course Training	Experience
41 Inform patient's family of patient's general condition	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
42 Inform patient's attending physician of patient's death	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
43 Inform Coroner's office of patient's death	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
44 Use an emisis basin in treating nauseated patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
45 Use a urinal to provide the patient with an opportunity to urinate	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
46 Use a bedpan to provide the patient with an opportunity to defecate	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
47 Use sandbags to immobilize patient's cervical spine (neck)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
48 Use a cervical collar to immobilize patient's neck	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
49 Use a 3-foot spine board to immobilize patient's spine to transport	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
50 Use a 6-foot spine board to immobilize patient's spine to transport	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

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INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	How often do you perform this task?					Is another individual usually involved?			How much supervision is received?			How difficult is this task?			How much skills and knowledge is required?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Not Involved	Close Supervision	General Directions	No Supervision	Easy	Moderate	Difficult	General Knowledge	On-the-job-training	Extensive Training	Experience
51 Use nasal cannula to administer oxygen	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
52 Use mask to administer oxygen	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
53 Use a traction splint to treat a lower extremity fracture	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
54 Use a pneumatic (air) splint to immobilize a closed fracture	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
55 Use a padded board splint to immobilize a fracture	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
56 Use a sling to immobilize a fractured arm or clavicle	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
57 Apply direct pressure to control hemorrhage (bleeding)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
58 Apply digital pressure to control hemorrhage	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
59 Apply tourniquet to control hemorrhage	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
60 Apply dressing to control hemorrhage	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

EMERGENCY MEDICAL TECHNICIAN Page 7

INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	Frequency: How often do you perform this task?					Supervision: To what individual usually involved?			Supervision: How much supervision received?			Difficulty: How difficult is this task?			Training: How much skills and knowledge required?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Equal Involvement	Close Supervision	General Direction	Little Supervision	Easy	Moderate	Difficult	General Education	On-Job Training	Occupational Training	Experience
61 Apply bandage to secure dressing to wound	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
62 Apply bandages to immobilize a fracture (e.g., ribs)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
63 Apply a stegile dressing to treat a burn	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
64 Apply cold wet applications to treat a burn	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
65 Apply vaseline gauze or other non-porous material to seal a pneumothorax (sucking chest wound)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
66 Use a bulk dressing to immobilize an impaled object	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
67 Use a constricting band to treat a snakebite	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
68 Make an incision over fang marks and suck out snake venom	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
69 Elevate the head and shoulders of a patient who is having difficulty in breathing	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
70 Use an oropharangeal airway to maintain a patent (open) airway	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

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INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	How often do you perform this task?					To what level of individual ability involved?			Level of supervision involved?			How difficult is this task?			Skills and knowledge required?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Total Involvement	Close Supervision	Limited Supervision	Supervision	Easy	Moderate	Difficult	Limited Skills/Knowledge	Basic Skills/Knowledge	Considerable Skills/Knowledge	Experience
71 Use an oxygen demand valve to administer oxygen	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
72 Use an oxygen demand valve to perform intermittent positive pressure ventilation (IPPV)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
73 Use an S-tube airway adjunct to perform IPPV	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
74 Use an endotracheal tube to maintain an open airway	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
75 Administer oxygen through a mask	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
76 Administer oxygen through a nasal cannula	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
77 Administer oxygen through an oxygen catheter	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
78 Administer oxygen through an incubator system	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
79 Administer Holger-Neilson (back pressure-arm lift) method of resuscitation to ventilate patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
80 Operate pressure-cycled, oxygen-powered automatic mechanical resuscitator to perform IPPV	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

EMERGENCY MEDICAL TECHNICIAN

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INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	How often do you perform this task?					In addition individuals usually involved?			How much supervision received?			How difficult is this task?			How much skills and knowledge required?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Team Effort	Close Supervision	Limited Supervision	No Supervision	Easy	Moderate	Difficult	Little Experience	Some Experience	Considerable Experience	Extensive Experience
81 Operate an oxygen-powered, manually triggered, mechanical ventilation device(e.g., Elder demand valve)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
82 Maintain body temperature and elevate lower extremities to treat patient for shock	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
83 Treat a conscious patient who has ingested a poison	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
84 Operate vehicle mounted suction to remove fluids from patient's airway	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
85 Operate portable suction unit to remove fluids from patient's airway	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
86 Administer patient's insulin to treat a patient in a diabetic coma	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
87 Administer sugar or sugar product to treat patient in insulin shock	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
88 Use cold applications to lower patient's body temperature	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
89 Use warm water (100-105 F) to treat frostbite	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
90 Use a flashlight to examine the pupilary reaction of a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

EMERGENCY MEDICAL TECHNICIAN

INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	How often do you perform this task?					Is assistance usually involved?			How much supervision is received?			How difficult is this task?			How much skills and knowledge is required?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Equipment	Constant Supervision	Moderate Supervision	Little Supervision	Easy	Moderate	Difficult	Little Training	Some On-the-Job Training	Extensive Training	Experience
91 Use cold pack to treat injury to soft tissue	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
92 Maintain drainage tubing without suction (e.g., urinary catheter)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
93 Perform an emergency childbirth delivery	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
94 Place deceased patient in a disaster pouch	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
95 Place deceased patient in a shroud	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
96 Use restraint straps to control a combative patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
97 Use a geiger counter to detect radiation level	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
98 Operate a hydraulic lift (Hoyer) to move patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
99 Perform cardiopulmonary resuscitation (CPR) without the use of life-support equipment	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
100 Perform CPR with the use of life-support equipment	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

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INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	How often do you perform this task?					Is a partner usually involved?			How much supervision is received?			How difficult is this task?			How much skills and knowledge is required?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Not Applicable	Close Supervision	Moderate Supervision	Little Supervision	Easy	Moderate	Difficult	Limited Knowledge	Some Job-Related Skills and Knowledge	Highly Skilled Technician	Experience
101 Operate a bag-valve mask unit to perform intermittent positive pressure ventilation (IPPV)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
102 Use a bag-valve mask unit to perform IPPV	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
103 Perform mouth-to-mouth method of IPPV	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
104 Perform mouth-to-nose method of IPPV	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
105 Use a sphygmomanometer (blood pressure cuff) and stethoscope to obtain a patient's blood pressure	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
106 Place fingers on patient's wrist to count radial pulse	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
107 Assemble intravenous fluid administration equipment	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
108 Perform a venipuncture to administer intravenous fluids	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
109 Use a syringe to administer intravenous medications into the I.V. tubing	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
110 Use a syringe to administer intravenous medications	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

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INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	FREQUENCY: How often do you perform this task?					INVOLVEMENT: To what individual usually involved?			SUPERVISION: How much supervision received?			DIFFICULTY: How difficult is this task?			TRAINING: How were skills and knowledge received?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Equal Involvement	Close Supervision	General Supervision	No Supervision	Easy	Moderate	Difficult	General Education	On-Job-Training	Occupational Training	Experience
111 Use a syringe to administer intramuscular medications	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
112 Operate a defibrillator to administer empirical defibrillation	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
113 Operate an electrocardiograph (EKG or ECG) scope and recorder to observe patient's cardiac activity	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
114 Operate one-way electrocardiograph telemetry system to transmit (EKG or ECG)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
115 Operate a two-way voice communication radio	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
116 Answer telephone to receive requests for ambulance service	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
117 Perform minor mechchanical maintenance on emergency medical equipment	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
118 Perform building maintenance on physical facility	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
119 Replace oxygen tank in vehicle	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
120 Refill oxyyen tanks with compressed oxygen	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

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INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	Frequency: How often do you perform this task?					Supervision: To what level of individual responsibility involved?			How much supervision received?			Difficulty: How difficult is this task?			Training: How were skills and knowledge received?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Total Supervision	Close Supervision	General Direction	No Supervision	Easy	Moderate	Difficult	Formal Education	On-Job-Training	Occupational Training	Experience
121 Extricate an entrapped patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
122 Direct traffic at scene of accident	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
123 Use highway flares to control traffic at accident scene	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
124 Use portable floodlights to illuminate work area	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
125 Instruct patient's family how to care for patient at home (e.g., use of urinary catheter, dressing wounds)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
126 Evaluate quality of training program	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
127 Conduct on-the-job training sessions	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
128 Conduct formal classes or training sessions to instruct individuals in emergency medical care techniques	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
129 Use an orthopedic stretcher to transport a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
130 Use a variable position stretcher to transport a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

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INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	Frequency: How often do you perform this task?					Is another individual usually involved?			How much supervision received?			How difficult is this task?			How were skills and knowledge received?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	No, Assist	Yes, are Assisted	Yes, I Supervise	Close Supervision	General Direction	No Supervision	Easy	Moderate	Difficult	Formal Education	On-the-job training	Supplemental Training	Experience
131 Use a stretcher composed of rubberized canvas on an aluminum frame to transport a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
132 Use a stretcher composed of rubberized canvas on an aluminum frame to suspend a patient from the ceiling of an ambulance	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
133 Use a chair stretcher to transport a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
134 Use a chair to transport a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
135 Use a wheelchair to transport a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
136 Drive an emergency medical vehicle (ambulance) to transport a patient under non-emergency conditions	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
137 Drive an emergency medical vehicle to transport a patient under emergency conditions using emergency warning devices (e.g., siren, red beacon light)	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
138 Operate a fire control device (fire extinguisher) to extinguish a fire	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
139 Use a watercraft to transport a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
140 Use a fixed wing aircraft (airplane) to transport a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

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INSTRUCTIONS: Read each task and circle the appropriate number to show your answer in each category.

	How often do you perform this task?					Is another individual usually involved?			How much supervision received?			How difficult is this task?			How much skills and knowledge received?			
	Several Times a Day	Once a Day or Several Times a Week	Once a Week or Several Times a Month	Once a Month or Less	Never	You Assist	You are Assisted	Equal Involvement	Close Supervision	General Direction	Little Supervision	Easy	Moderate	Difficult	Formal Education	On-Job-Training	Occupational Training	Experience
141 Use a rotary wing aircraft (helicopter) to transport a patient	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4
	1	2	3	4	5	1	2	3	1	2	3	1	2	3	1	2	3	4

Maintain, in the unit, information concerning the use of narcotics

Maintain patients' dietary restrictions to assure patient receives proper diet

Supply, on request, information concerning unit function or status to other staff, new employees, physicians or visitors

Prepare, maintain and control personnel records for employees working in the department

Determine the required inventory of medical supplies, equipment, drugs, etc. necessary to assure adequate patient care

Determine the need to order medical supplies, equipment, drugs, etc.

Determine required inventory of general unit supplies necessary to assure efficient operation of the unit.

Determine the need to order general unit supplies

Determine the need for services such as maintenance and housekeeping to be performed

Communicate the status and condition of patient to physician, other departments, clergy or family

Inspect the unit to determine if safety regulations are being met

Explain to patients, family and/or visitors hospital procedures, rules and regulations

Interview patient to determine special needs, problems and requests

Instruct patient and/or family on care of patient upon discharge (e.g., general hygiene, special procedures, etc.)

Provide information to visitors concerning the functioning of the unit, or the hospital

Provide required drugs or prescriptions for patients

Conduct fire or disaster drills

Conduct interview and/or test to determine if applicant meets standards for employment

Develop job descriptions for employees within the unit

Prepare budget (yearly or monthly) for operation of the unit.

Conduct meetings with unit personnel

Determine staff required to operate unit effectively in any specific time period

Determine work schedules and assignments for personnel in the unit

Evaluate unit personnel to determine progress, raises, discipline and promotion

Develop policies and procedures to provide guidelines for daily operation of the unit and handling personnel problems

Lead interdisciplinary or interdepartmental task forces brought together to solve a specific problem or group of problems

Prepare written reports to communicate progress of the unit to staff members and other departments

Develop departmental procedure manual

Develop departmental policy manual

Evaluate equipment performance

Plan space requirements necessary for operation of the department or unit

Coordinate work schedules with other departments

Assign personnel to perform specific duties within the department

Develop departmental evaluation procedures

Design home care programs

Implement home care programs

Determine problem areas within the field of respiratory care which require research

Conduct research experiments into problem areas within the field of respiratory care

Evaluate results of research programs

Report in writing the results of the research

Inform patient or family of any treatment procedures to be used

Prepare, maintain and control patients' charts and records

Maintain call roster of physicians

Maintain files of correspondence, memorandums, reports, personnel records, etc.

Operate typewriter to produce typewritten copy of correspondence, reports, memos, labels, etc.

Complete information required by special forms to report such things as patient's death, special treatments and accidents

Place order for supplies necessary to operate unit

Receive and direct telephone calls to members of the unit staff or patients

Maintain patient's personal belongings during stay in hospital

Operate paging system to page physicians and/or announce end of visiting hours

Operate photocopier to copy forms, memos, correspondence, etc.

Maintain appropriate reading materials to be available to patients and/or visitors

Determine patient charges incurred to provide information for patient billing

Stock inventory with medical supplies, equipment, drugs etc.

Stock inventory with general unit supplies

Perform general patient services such as contacting physician; distributing mail, flowers, and gifts; making appointments; arranging for transportation

Develop in-service training programs to train employees

Conduct in-service training classes and workshops to train employees

Conduct classroom instruction

Orient new employees to hospital and/or departmental procedures

Take patient's body temperature using a mercury thermometer

Watch patient's chest to count respirations per minute

Place fingers on patient's wrist to count radial pulse

Use a spygmomanometer (blood pressure cuff) and stethescope to obtain patient's blood pressure

Use an emisis basin in treating nauseated patient

Use a urinal to provide the patient with an opportunity to urinate

Use a bed pan to provide the patient with an opportunity to defecate

Use sandbags to immobilize patient's cervical spine (neck)

Use a cervical collar to immobilize patient's neck

Use nasal cannula to administer oxygen

Use mask to administer oxygen

Use an oropharangeal airway to maintain an open airway

Use an oxygen demand valve to administer oxygen

Use an oxygen demand valve to perform intermittent positive pressure ventilation (IPPV)

Operate treatment (IPPB) respirators

Operate assisters

Operate controllers

Use an S-tube airway adjunct to perform intermittent positive pressure ventilation (IPPV)

Use an endotracheal tube to maintain an open airway

Administer oxygen through an incubator system

Administer Holger-Neilson (back pressure-arm lift) method of resuscitation to ventilate patient

Operate pressure-cycled, oxygen-powered automatic mechanical resuscitation to perform IPPV

Use isolation techniques

Service 02 delivery system

Maintain anesthetic gas supply

Use hypothermal technique(s)

Alter respirator settings on the basis of blood gas data

Alter respirator settings of the basis of observations

Improvise or modify equipment for special requirements

Stock and dispense cylinder gas

Stock and dispense departmental drugs

Mix and measure drug doses

Read patients' charts to gather information concrning the patients' condition

Report treatment given on patients' charts

Perform chest physiotherapy

Perform endotracheal intubations

Operate CO2 rebreathers

Perform hyperbaric procedures

Operate vaporizer (steam) type aerosol generators

Operate jet type (venturi) aerosol generators

Administer exercise and conditioning treatments

Operate nebulizer type humidifiers

Operate centrifugal type humidifiers

Operate ultrasonic type humidifiers

Use portable (tank) 02 in treatments

Use piped 02 in treatments

Use mixed gases in treatments

Use bronchodilators to treat patient

Use detergents to treat patient

Use mucolytics to treat patients

Use proteolytic enzymes to treat patient

Use antiblotics to treat patient

Use steroids to treat patient

Use antifoam agents to treat patient

Perform ausculation

Perform functional residual capacity tests using nitrogen wash-out method

Perform functional residual capacity tests using heilum dilution methods

Perform functional residual capacity tests using body box (plethysmograph)

Perform forced vital capacity spirometry tests

Perform slow vital capacity tests

Perform bedside spirometry tests

Perform maximum voluntary ventilation (MVV) tests

Perform expired air collection and analysis tests

Perform diffusion capacity tests

Perform compliance measurements tests

Perform airway resistance measurements tests

Perform alveolar P CO2 measurements tests

Estimate arterial P CO2

Measure cardiac output using Fick principle

Measure cardiac output using indicator dilution technique

Measure cardiac output using plethysmography

Perform pneumotachometer tests

Perform radioactive gas techniques (ventilation/perfusion)

Perform calculations for pulmonary function tests and compare the results to norms

Evaluate the results of the pulmonary functions tests to determine need for specific treatments

Perform simple blood gas analysis

Perform multiple blood gas analysis

Perform blood gas tensions analysis

Operate pressure transducers

Administer exercise testing

Measure blood pH

Operate multi-channel recorder(s)

Operate telemetry systems

Perform cardiac catheterization

Induce and collect sputum samples

Collect tracheal-bronchial secretions

Perform arterial punctures

Use a traction splint to treat a lower extremity fracture

Use a pneumatic (air) splint to immobilize a closed fracture

Use a padded board splint to immobilize a fracture

Use a splint to immobilize a fractured arm or clavicle

Apply direct pressure to control hemorrhage (external bleeding)

Apply digital pressure to control hemorrhage

Apply tourniquet to control hemorrhage

Apply dressing to control hemorrhage

Apply bandage to secure dressing to wound

Apply bandages to immobilize a fracture (e.g., ribs)

Apply a sterile dressing to treat a burn

Apply cold wet applications to treat a burn

Apply vaseline gauze or other nonporous material to seal a pneumothorax

Use a bulk dressing to immobilize an impaled object

Use a constricting band to treat a snakebite

Make an incision over fang marks and suck out snake venom

Elevate the head and shoulders of a patient who is having difficulty in breathing

Maintain body temperature and elevate lower extremites to treat patient for shock

Treat a conscious patient who has ingested a poison

Operate suction unit to remove fluids from patients' airway

Use cold applications to lower patients' body temperature

Use warm water (100-105 F) to treat frostbite

Use a flashlight to examine the pupilary reaction of a patient

Use cold pack to treat injury to soft tissue

Maintain drainage tubing without suction (e.g., urinary catheter)

Perform an emergency childbirth delivery

Place deceased patient in a disaster pouch

Place deceased patient in a shroud

Use restraint straps to control a combative patient

Operate a hydraulic lift (Hoyer) to move patient

Perform cardiopulmonary resuscitation (CPR) without the use of life-support equipment

Perform CPR with the use of life-support equipment

Operate a bag-valve mask unit to perform intermittent positive pressure ventilation (IPPV)

Perform IPPV on a laryengectomy patient

Perform mouth-to-mouth method of IPPV

Perform mouth-to-nose method of IPPV

Assemble intravenous fluid administration equipment

Perform a venipuncture to administer intravenous fluids

Use a syringe to administer intravenous medications into the I.V. tubing

Use a syringe to administer intravenous medications

Use a syringe to administer intramuscular medications

Operate a defibrillator to administer empirical defibrillation

Operate an electrocardiograph (EKG or ECG) scope and recorder to observe patient's cardiac activity

Identify wave forms of ECG (EKG)

Operate one-way electrocardiography telemetry system to transmit or receive ECG

Operate a two-way voice communication radio

Answer telephone to receive requests for ambulance service

Use a variable position stretcher to transport a patient

Use a wheelchair to transport a patient

Prepare patient to see clergy or receive sacraments

Use overbed cradles or footboards to prevent top covers from touching patient

Use soap, water and lotion to provide skin care to patient

Manually remove fecal impactions to facilitate adequate elimination

Maintain record on patient's fluid balance by recording fluid intake and output

Feed patient by placing food on tray or near bed

Feed patient by placing food in patient's mouth

Instruct patient to cough and deep breath to maintain adequate cardiopulmonary activity

Act as a consultant to other departments (e.g., dietary, respiratory care)

Collect specimines (e.g., urine, stool and sputum) for analysis

Collect cultures (e.g., nose, throat and wound) for analysis

Perform urine reduction

Use thermometer to take patient's temperature

Operate Stryker and Foster frames

Operate circle beds

Apply orthopedic braces

Maintain humidifier system

Maintain croupette

Instill solutions into body orifices for cleansing and treatment

Perform rectal examination

Perform vaginal examination

Prepare patient for proctoscopic examination

Perform somatic therapies (e.g., insulin shock treatments, electroconvulsive treatments)

Use hot applications for theraputic purpose

Use cold applications for theraputic purposes

Administer therapeutic baths

RADIOLOGY TECHNICIAN TASK LIST

Review patient's clinical history

Type correspondence

Load (unload) film units

Number cassettes or screens for identification

Affix identification number to x-ray film

Load cameras for cinefluorography

Process films in surgery

Perform silver recovery operation

Perform safety check for exposure safelights

Maintain automatic processing machines

Operate automatic processing machines

Replace and mount x-ray screens

Maintain darkroom facilities and equipment

Prepare processing solutions

Mount films in viewing apparatus

Replenish solutions

Store unexposed films

Keep film hangers

Keep cassettes

Operate polaroid units

Operate control panel settings

Operate video tape equipment

Label and transfer specimens

Operate cinefluorographic equipment

Operate image intensifier fluoroscopic units

Operate mobile x-ray units

Perform x-ray for cholecystographic studies

Calibrate x-ray machines

Test for screen film contact

Test for x-ray beam alignment

Develop technical procedures for special radiology examinations

Direct quality control functions

Position patients for therapy treatment

Select immobilization devices

Place patient in radiographic position

Take abdominal x-rays

Take spinal x-rays

Take chest x-rays

Take facial x-rays

Take mastoid x-rays

Take paranasal x-rays

Take x-rays of extremities

Take x-rays of ribs and sternum

Perform mammograms

Perform urographic studies

Perform steroscopic x-rays

Perform upper GI series

Perform x-rays for pelvimetric studies

Perform fistula or sinus tract x-rays

Prepare trays for special examinations

Prepare contrast media

Administer radiopaque preparations

Test for sensitivity to allergic reactions to contrast

Perform urographic studies

Perform x-rays for contrast studies of large bowel or colon

Perform x-rays for contrast studies of esophagus

Perform x-rays of small intestine

Develop technical procedures for special radiology examinations

Wash and sterilize treatment facilities

Make catheters for special x-ray examinations

Operate autoclave

Provide surgical x-ray assistance to physician

Perform cardiac catheterization and anicardiogram

Record patient's blood count

Coordinate communicable disease investigation

Assist patients to or from litters or wheelchairs

Prepare patients for examinations

Give standard first-aid treatment

Sterilize equipment

Change dressings

Transport patients

Perform arthrograms

Perform bronchiograms

Perform cerebral angiograms

Perform gynecograms

Perform hysterosalpingograms

Perform cholangiograms

Perform intravenous pyelograms (IVP'S)

Perform laminograms

Perform macroradiograms

Perform penumocardiograms

Perform pneumocystograms

Perform pneumoencephalograms

Perform urographic studies

Perform scanograms

Perform sialograms

Store radioactive materials

Test for scatter radiation

Measure radiation in patient's clothing, wastes and bandages following treatment

Perform decontamination procedures

Issue and collect film badges or other radiation detectors

Keep blood count records on radiology personnel

Plan emergency evacuation of patients, establish emergency priorities

Direct personnel in compliance with radiation safety regulations

Do special procedures

Perform ventriculograms

Perform substraction techniques

Assist radiologist in treatment planning

Attach cones and filters for radiation therapy

Measure biological half-life of radioactive materials

Measure radiation level of cadavers prior to autopsy or release

Instruct patient prior to theraputic administration of cobalt, roentgen or radium

Load applicators for radium therapy

Operate cobalt or super-voltage therapy machines

Operate ortho-voltage equipment

Perform functional checks on radiation therapy equipment

Perform radioisotope therapy

Operate low-voltage roentgen therapy equipment

Operate betatron therapy equipment

Operate linear accelerator therapy equipment

Dispose of radioactive materials

Take treatment and port films

Direct therapeutic patient care procedures

Calculate dosages to be administered for prescribed procedures

Take dental x-rays

Prepare and keep index file

Assemble, index and file x-ray films

Forward x-ray reports to physician

Process loans of x-ray films to physicians or hospitals

Review, retire, or dispose of films and x-ray indices

Keep blank forms for management control

Keep files of correspondence

Keep operating file of regulations, instructions and/or policies

Keep publications reference files

Keep radiologic diagnostic index

Keep radiology work record for statistical purposes

Keep accounts for direct billing

Prepare financial statements for direct billing

Prepare and submit supply requests

Prepare statements for direct patient billing

Coordinate patient clinical management

Develop procedures for data processing

Coordinate radiology activity with hospital administration

Coordinate work functions of volunteers, (hours, patient handling)

Coordinate physical plant work orders or requests

Develop organizational functional charts

Prepare budget estimates and justification

Establish and direct administrative operating policies, procedures and regulations

Modify work methods and procedures

Develop and prepare cost analysis data

Schedule work assignments

Plan or modify radiology facilities' physical layout, space assignment

Plan and direct the filing and distribution of reports, records and correspondence (patient and department)

Direct diagnostic patient care procedures

Direct therapeutic patient care procedures

Direct nuclear medicine patient care procedures

Prepare and submit job descriptions

Interview and evaluate prospective employees

Resolve staff complaints

Resolve technical problems

Supervise technical staff

Investigate reports of unusual incidents

Serve on employee relations boards

Prepare employee ratings and counsel individuals in progression and career development

Plan, schedule and evaluate training programs

Evaluate instructors

Select and assign instructors

Supervise training program

Recruit trainees

Undertake placement activities

Originate correspondence

Prepare special orders on assignment, reassignment or transfer of patients

Establish an inventory system for supplies, equipment and material

Keep on call roster of doctors and/or technicians

Keep personnel file

Initiate authorization forms for administration of anesthesia or for performing operations

Initiate authorization forms for examinations of minors or mental incompetents

Prepare patient examination schedule

Develop patient instruction forms for radiologic examinations

Prepare vacation schedule

Prepare formal requests for radiation source changes

Clean radiographic equipment

Do minor repairs or adjustment to x-ray machine

Set up and schedule contract preventive maintenance programs

Orient newly assigned personnel

Detect, identify, and measure radioisotopes in samples

Perform scan utilizing specialized electronic detectors

Use radioactive sources in research

Reproduce x-ray films on 35-mm slides

Reproduce x-ray by direct duplication method, microfilm or microfiche

Arrange for training aids, space and equipment

Conduct formal classroom instruction

Conduct on-the-job training

Keep and review student training records

Prepare, administer and score tests

Operate audio-visual aids

Analyze technical radiology research data

Assemble equipment for research

Design radiology research

Write reports or technical papers for publications

Compile experimental data for reports

Coordinate experimental program design with statistician and external and internal agencies

Design and develop experimental devices or equipment

Design forms for maintaining radiology research data

FOOD SERVICE TASK LIST

MENU PLANNING

Plan general menus for patients

Plan menus for patients with special dietary restrictions

Plan menus for hospital cafeteria

Examine menu changes to approve those changes

Conduct periodic menu meetings with production personnel regarding the completion of the menu plans, procedures, etc.

FOOD PROCUREMENT

Purchase Food: determine what needs to be purchased; determine standards for grade and quality; locate supplies; prepare requisition and analyze prices or obtain bids; place order; make record of purchase order and distribute to proper unit(s)

Receive Purchases: check packing list with purchase order; inspect shipment, if returns or adjustments are needed, handle them; distribute receipt of purchase to proper unit(s)

Storage of Foods: place received items in proper storage; regularly inspect stored items; keep inventory of stored items

Distribute Food: receive request for items; distribute items; adjust and record inventory to keep constantly up-to-date

Vendor Supplies: prepare and forward requisitions to general store or individual vendors after determining need; receive supplies; record receipt; etc.

FOOD PRODUCTION

Preparing for Food Production: receive patient census and menu tally; determine kind and quantity of food needed; check if needed foods are in stock

Selecting Recipes: select recipes to be used; expand or decrease prescribed quantities; periodically review recipes and records adjustment at regular intervals

Preparing Foods: determine area for each preparation; assign work orders to each food station; assign work order for each personnel at each work station; generally supervise production at each work station

Preparing Food Production at Station: assign work order for personnel at station; requisition food from proper personnel; assemble necessary food item for each preparation center;

assemble necessary equipment and supplies

Preparing Food at Station: give necessary foods and equipment; combine or mix required proportions at appropriate time according to specification in recipe

Prepare:

- appetizers
- soups
- fruits and juices
- salads
- sandwiches
- fountain items
- relishes
- meats
- poultry
- fish
- eggs
- cooked vegetables
- potatoes, rice, noodles, etc.
- casseroles
- gravies and sauces
- hot cakes, french toast, hot cereals
- bake desserts
- puddings
- pies or pastries
- cakes
- breads and rolls
- toast
- beverages
- process prepared or convenience foods

After Food Production: return excess food to storage; decide on method of disposing of substandard foods

Organize and assemble proportioned food items at tray line

Portioning:

- slice butter and place on pats
- wrap sandwiches
- portion drinks
- portion bread
- portion cakes and pies

Prepare Special Menus such as Diets: tally menu cards for modified or special menus; compute portions; assemble tray; transfer to holding area

PATIENT FOOD SERVICE

Tally Slips: prepare menu slips and tray cards; distribute to patients; receive completed slips from patients; transfer patient food order to patients records; tally orders for tray line and production area

Receive diet orders or selection menu from patients; transfer patients food order to patients record; inform appropriate production personnel

Dish out hot and cold foods in standardized manner

Maintain food serving temperatures

Check menu with tray contents and correct where needed

Place trays in conveyor or cart

Transport trays to serving unit

Serve food to patients; distribute trays; provide menu substitutes; pick up soiled trays and return to dish washing area

PATROL FOOD SERVICE: CAFETERIA, DINING ROOM, VENDING MACHINE

Determine what food is needed; order from center kitchen; store items in refrigerator or warmers when food is received; check to determine if ordered food is received

Prepare food or special items not produced in main kitchen

Set up menu boards

Set up serving lines; arrange food in warmers; arrange beverages, trays, utensils, etc.

Serve food to customers; dish up food; determine proportions; serve drinks, etc.

Bus dishes; clean tables; wash service areas and counters; dispose of waste

Remove counter leftovers and return for proper storage

Collect cash and operate cash register; make change; tally checks to compare with register total

Submit reports to proper business office personnel, such as financial reports on weekly receipts, inventory reports, purchase orders

Prepare rooms for special occasions, arrange chairs and tables; store, maintain and retrieve special equipment for such functions; clean room after functions; place things in proper order

Maintain vending machine operation, check vending machines for operating condition; check and control vending items served; stock vending machine; order items from vendor

SANITATION AND CLEANING

Inspect work areas and storage facilities to insure observance of sanitary standards

Maintain standards of employees' personal habits as related to the job -- hair nets, hats, etc.

Wash dishes by methods prescribed for facility

Clean cooking and serving utensils; receive cooking and serving utensils; mix cleaning solutions, etc.

Schedule work assignments for cleaning all areas and equipment; contact personnel, and assign them to perform required jobs

Wash dishes by method prescribed for facility

Clean cooking and serving utensils

Collect specimens for culturing

Contract for exterminator services, if needed

SAFETY

Conduct regular and disaster drills

Inspect and maintain equipment in safe operating conditions

Maintain a safety record file noting date of drills, date of inspections, results of drills and inspections, etc.

Conduct safety inspections periodically; review safety program; make adjustments, etc.; record adjustment, if made

EMPLOYEE UTILIZATION

Determine critical or noncritical time-category for each task

Schedule basic task where time is critical and noncritical

Assign individuals to specific schedules for holidays, vacations and leaves; keep records

Check to see if individuals are on duty

Provide controls for all hours of operation

Deal with specific staff problems, complaints and grievances

NUTRITION SERVICES

Develop and constantly update diet mannual

Plan and conduct individual patient diet instruction; read patient charts; consult with nurses and physicians concerning patients' needs; prescribe and write diet

Provide discharge diet instructions to patient or request from physician

Refer patient to nutrition clinic and social services for follow-up care

Act as consultant to medical social worker and other patient care personnel

Calculate diets where necessary

Counsel staff and other departmental personnel in therapeutic information

Supply diet instruction form

Obtain nutrient analysis data on food products

Make floor rounds with medical staff; collect diet information on patients' needs and past records

RECORDS AND FORMS

Maintain a procedure book for department record keeping, forms, reports, instructions on how to complete, etc.

Record and keep up-to-date job description

Keep personnel records, work schedules, time off, sick leave, work assignments, measures of performance, recommendations, etc.

Keep such files as menu files, inventory files, new product information files, daily food production records, recipe files, procedure for preparing prepared foods, food sales records, food consumption records, current price book for food purchases, equipment repair and maintenance, general housekeeping records

Develop records or forms to be used

ADMINISTRATIVE FUNCTIONS

Establishing Objectives and Polices:

Formulate objectives and goals of dietary department

Develop policies and establish procedures for activities within the department

Develop policies for coordinating dietary activities with other departments in the facility

Translate policies into acceptable performance standards and establish devices to measure performance

Develop policies for safety, fire prevention, disaster, and emergency control procedures

Develop security procedures

Plan Department Organization:

Determine staffing needs

Develop organizatioal chart

Develop job descriptions and titles and specifications for positions in food service department

Budgeting:

Prepare cost figures of food and supplies for past period

Prepare labor hours for past period

Determine outlay for new capital equipment and construction

Estimate price change

Prepare budget

Submit budget for correction and approval by department head and administrator of institution

Prepare budget evaluation

Personnel Selection:

Identify tasks to be performed by each worker

Interview and evaluate job candidates

Hire applicant

Review objectives, policies, and standards with new employee

Recommend personnel for merit raises, promotions and upgrading

Transfer employees to other job activities

Terminate employee services

Direct Supervisory Staff:

Assign responsibilities and follow through on performance

Conduct staff meetings

Evaluate performance of supervisory staff

Review departmental procedures to develop and improve work methods

Coordinate Activities Within Department and Total Facility:

Attend meetings with administrative personnel, staff, etc.

Coordinate assignments of regular and volunteer workers with other departments

Investigate and correct grievances, complaints and suggestions of other department personnel, patients, and customers

Prepare report such as department performance reports, reports of meetings, problem of coordination, etc.

Research:

Test, evaluate and report on equipment

Test, evaluate and report on new food products

Plan, develop and conduct food acceptance studies, waste studies, survey market for new food products, and therapy studies

Utilize the computer system to analyze data, to store information, to schedule personnel, etc.

Investigate shared systems in regional hospital programs

PUBLIC RELATIONS

Represent your department and facility at community meeting, giving speeches, etc.

Make arrangements for community groups to use your facility for meetings; make arrangements for room, etc.

Resolve patients' compliants

Contribute to facilities' publications,brochures, pamphlets, etc.

PLANNING CHANGES AND ADDITIONS

Set-up specifications for equipment, room sizes, etc.; if needed, consult with food specialist and architects

Purchase equipment and other materials for the changes or additions

Plan small tool maintenance or replacement

EDUCATION AND TRAINING

Plan educational programs, determine areas in which training is needed; establish time schedules of offering arrange for training aids, space, equipment and instructions; review and evaluate training effectiveness

Develop plans for on-the-job instructions

Give on-the-job instructions

Conduct classes or conferences for department and nondepartmental personnel including work shops

Keep file and reference library publications

Write articles for professional journals

APPENDIX C: PARTIAL ALLIED HEALTH LABOR MARKET STUDY: CITY OF PHILADELPHIA

APPENDIX C

PARTIAL ALLIED HEALTH LABOR MARKET STUDY:

CITY OF PHILADELPHIA

ABSTRACT

Occupational data on selected allied health titles are presented. The data consist of:

1. Current and past number of titles holders.
2. Current number of turnovers.
3. Expected gains or loss due to expansion or contraction.
4. Number of title holders supported by grants.
5. Current average starting salaries.
6. Current employment criteria.
7. Number of male title holders.

The data are discussed in terms of the feasibility of providing educational programs for the titles in the City of Philadelphia.

It was concluded that:

1. The greatest demand is for Medical Secretaries.
2. The feasibility of providing training for future Mental Health Workers, Family Health Workers, Nursing Services Technicians and Operating Room Technicians is questionable.

PARTIAL ALLIED HEALTH LABOR MARKET STUDY:

CITY OF PHILADELPHIA

Educational Projects, Incorporated
Pittsburgh, Pennsylvania 15213

INTRODUCTION

Community college officials are often faced with the problem of determining local manpower demands for selected occupational titles (i.e., they find it necessary to determine the feasibility of expanding, continuing, or providing "new" training or educational programs). Their interest in local labor market activities is partially explained by their commitment to "better" serve and understand their communities.

Community colleges usually do not have the needed personnel nor money to conduct comprehensive labor market studies. Further, there is no reason to suspect that community colleges are interested in collecting data on the variables that are traditionally examined in a comprehensive labor market study.

The following data collection on eight selected allied health occupational titles was initiated by the desire to determine the feasibility of providing job-related training or educational programs for individuals seeking employment in these titles in the Philadelphia region. The occupational titles of interest were: Medical Secretaries, Mental Health Workers, Family Health Workers, Nursing Services Technician, Operating Room Technician, Emergency Room Technician and Emergency Medicial Technicians I and II.

The occupational data of interest consisted of two kinds:

(1) data which could be used to estimate demand:

  (a) the past (by year) and current number of occupational title holders in the City of Philadelphia;

  (b) the current number of turnovers in each occupational title as well as the major reason for the turnovers (e.g., geographical relocation, marriage, job mobility within the holder's institution, job mobility outside the employee's institution, perceived job dissatisfaction, etc.);

  (c) the expected gains or losses in the number of title holders due to possible employer expansion or contraction;

  (d) the number of title holders supported by federal, state, local or private grants, as well as the number of holders who would be terminated if the grants would be discontinued; and,

(2) data which could be used to determine characteristics of current title holders (this data could be used to determine what kind of students or trainees would be attracted to specific educational

training programs):

(a) the current average starting salaries of title holders;

(b) the current employment criteria in terms of educational exposure and past work experience;

(c) the number of male occupational title holders.

Although more data could have been collected, it was of interest to determine if such information would be sufficient to make intelligent decisions about the feasibility of providing training. In addition, time and money constraints limited the scope of the data collection. However, these conditions would not be considered unusual in a typical community college setting. Moreover, there was some interest in determining if such information could be "easily" collected from employers (i.e., would local employers be willing to volunteer such data?).

PROCEDURES

Each of the eight occupational titles of interest were further defined by a brief job description. This was done because it was anticipated that the responding institutions would not have standardized occupational titles (i.e., there was no inherent interest in the title, the interest was in the tasks and duties of the performer, no matter what the institution preferred to call the employee). The brief job descriptions were written by those familiar with the allied health occupation (e.g., the Emergency Medical Technician job

descriptions were written by an incumbent worker). The responding institutions were requested to respond to the questionnaire items by job description rather than occupational title.

The data of interest was further operationalized and specific items were developed. Careful attention was given to the wording of the items in order to eliminate ambiguities. In addition, each item was written such that the nature (form) of the required response was specified (e.g., each item required either a number, dollar amount, a rank, or a predetermined code number). No computations were required of the respondents (e.g., the respondents were not requested to compute the proportion of turnovers--turnover rates). This was done in order to reduce the amount of time required by the responding institutions since it was suspected that they would not be willing to respond if the interview schedule involved too much of their time. The interview schedule (questionnaire) contained thirteen (13) short items. The responses to the items were recorded on a matrix-type answer sheet.

Twelve hospitals and one mental health center in the City of Philadelphia were then selected to be administered the items. It is worthwhile to note that no sampling procedure was employed in selecting the institutions. The institutions were selected because it was anticipated that they would provide the greatest opportunity for placement of trained personnel. The available time and money did not permit the items to be piloted in other institutions. The personnel directors of each institution were then contacted, informed of the purpose of the study and asked if it was possible to schedule an interview time. No institution refused an interview.

The interviews were conducted by trained personnel, each interview lasted anywhere from forty-five minutes to an hour and a half. The interviewers requested the personnel directors to read the brief job descriptions and then the specific items were read to the personnel directors. The interviewers were instructed not to deviate from the provided interview schedule unless it was to further clarify any of the items. This helped to further standardize the interviews.

RESULTS

Summaries of all the item responses for all the occupational titles (job descriptions) will not be presented. Table I reports the number of Medical Secretaries, Mental Health Workers, Family Health Workers, Nursing Services Technicians and Operating Room Technicians employed in 1970, 1971, and 1972 (the number in parenthesis is the number of responding institutions).

Table I indicates that in the responding institutions there are relatively few Mental Health Workers and Family Health Workers. It should also be noted that the sums in Table I do not reflect the variance of the numbers of title holders in the responding institutions (e.g., one institution reported having 230, 240, and 260 Medical Secretaries for 1970, 1971, and 1972, respectively, while another reported only employing 3, 3, and 4 for 1970, 1971, and 1972 respectively). The individual differences in institutions is not important, since the concern is for the totals in the region of interest: City of Philadelphia. It is worthwhile to note that the number of Nursing Services Technicians employed has decreased in both the 1970-1971 and 1971-1972 year intervals.

TABLE I

NUMBER EMPLOYED IN JOB DESCRIPTION BY YEAR

TITLE	1970	1971	1972
Medical Secretary (12)	723	769	830
Mental Health Worker (5)	50	50	62
Family Health Worker (6)	20	30	37
Nursing Services Technician (6)	216	213	195
Operating Room Technician (12)	125	127	130

In order to estimate the number of employed personnel in the 1972-1973 interval, the proportion of increase (or decrease) was computed for each year interval (i.e., the sum differences between consecutive years was divided by the previous year's sums in each occupational title). Then the mean proportion as well as the variance of the interval proportion were computed. To obtain an estimate of the number of personnel needed in the titles, the mean proportions were multiplied by the 1972 sums for each title reported in Table I; the proportion of increase or decrease for each year interval, the mean proportions and variances and the estimated number of personnel needed are reported in Table II.

The reader should be aware that other procedures exist for estimating the number of personnel needed (e.g., a least squares estimate or a Bayesian estimate). This procedure was employed since it can be simply explained and it minimizes the amount of confusion that could result. In addition, the reader should be aware that the mean proportions in Table II were based on only two data points and as such the generated estimated numbers may not be that accurate. In order to reflect the errors in the estimates, the standard deviation of the interval proportions were computed and proportions $\pm$ 2 standard deviations from the mean proportions were multiplied by the 1972 sums. The procedure generates a band or interval for the estimates. The band estimates are also reported in Table II (e.g., the estimated number of Operating Room Technicians could be as high as 3.835 or as low as 1.235 for the 1972-1973 interval).

Table III reports the total proportions and number of turnovers in 1972 for each of the occupational titles in Table I.

TABLE II

PROPORTION OF INCREASE, MEAN PROPORTION AND

VARIANCE AND ESTIMATED NUMBER OF PERSONNEL

TITLE	PROPORTION OF INCREASE		MEAN PROPORTION	VARIANCE	ESTIMATED NUMBER	BAND
	1970-1971	1971-1972				
Medical Secretary	.063	.074	.0685	.0000605	56.855	± 13.11
Mental Health Worker	0	.240	.1200	.0288000	7.440	± 20.95
Family Health Worker	.500	.233	.3665	.0356445	13.560	± 13.95
Nursing Services Technician	.013*	.084*	.0485	.0025250	- 9.457	± 19.50
Operating Room Technician	.016	.023	.0195	.0000245	2.535	± 1.30

*Decrease

TABLE III

TOTAL PROPORTION AND NUMBER OF TURNOVERS IN 1972

TITLE	PROPORTION	NUMBER
Medical Secreteries	.27	228
Mental Health Worker	.15	9
Family Health Worker	.08	3
Nursing Services Technician	.23	44
Operating Room Technician	.12	15

From Table III, it would appear that Medical Secretaries tend to have the highest turnover rate, followed by Nursing Services Technicians. The reason for the turnovers for Medical Secretaries was reported to be marriage, while for Nursing Services Technicians the primary reason for the turnovers was reported by personnel directors to be job mobility outside the institution. It is also interesting to note that in 1972 the proportion of males employed as Medical Secretaries was only .0072, while for Nursing Services Technicians, the proportion of employed males was .21. It would appear that female Medical Secretaries tend to leave the labor market when they become married.

Caution should be exercised when using the turnover rates reported in Table III. These turnover rates (proportions) represent only the data for 1972 (i.e., these proportions may not be representative of past or future total turnover rates). For convenience, the turnover rates or number of turnovers for past years were not collected; to obtain such data may have caused undue burden on the interviewed institutions. It should also be noted that the proportion of turnover for each institution is not reflected in Table III (i.e., the total proportions neglect the individual differences in the reported turnovers of each institution).

If the turnovers reported in Table III are representative of future turnovers, then the estimated total number of available positions in 1973 for each occupational title can be obtained by adding together the estimated number of title holders from Table II and the turnover numbers in Table III. (If past turnover rates were collected, then bands on the number of turnovers could also have been computed.) The estimated total number of available positions are reported in Table IV without the estimated bands.

TABLE IV

ESTIMATED TOTAL NUMBER OF AVAILABLE POSITIONS

TITLE	TOTAL ESTIMATE
Medical Secretary	284.85
Mental Health Worker	16.44
Family Health Worker	16.56
Nursing Services Technician	34.54
Operating Room Technician	17.53

The estimated total number of available positions for Nursing Services Technicians needs further clarification. The number reported in Table IV is only reasonable if it is assumed that the terminated Nursing Services Technicians (reported in Table III) remain in the City of Philadelphia and take Nursing Services Technician jobs in other institutions. There is some support for this assumption in the data that was collected; recall the primary reason for the number of turnovers holding Nursing Services Technician title was reported to be job mobility outside the employee's institution.

There was some further confusing data for the Nursing Services Technician job title. When institutions were asked which occupational title would be effected "most" by any expansion, most indicated that they would employ more Nursing Services Technicians than any other occupational title. This inconsistency in the data (since the total number of employed Nursing Services Technicians has been declining) reflects the uncertainty in employment of a trained Nursing Services Technician.

Table V reports the median average starting salaries as well as the range in average starting salaries for each occupational title.

The large range in salaries for Family Health Workers and Operating Room Technicians is partially explained by the educational requirements and past work experience demanded by the reporting institutions (e.g., for Operating Room Technicians, one-third of the institutions reported no educational requirement, another one-third required a high school diploma or equivalency, one-quarter required some specific vocational training beyond high school, while the remaining institutions required beyond some college training; further,

TABLE V

THE MEDIAN AND RANGE OF AVERAGE STARTING SALARIES

TITLE	MEDIAN	RANGE
Medical Secretary	$6,164	$1,560
Mental Health Worker	$7,000	$1,994
Family Health Worker	$6,417	$3,200
Nursing Services Technician	$6,656	$1,477
Operating Room Technician	$6,110	$3,680

25 percent required some work experience in a related allied health profession). The range in salaries is due to the ranges in required work experience and educational background (i.e., those paying higher average starting salaries have a higher employment criteria).

Table VI reports the proportion and number of personnel reported to be supported by federal, state, local, and private grants. From Table VI, it is clear that proportion-wise more Family Health Workers are supported by "outside monies" than any other occupational title. However, there is reason to suspect that monies for the social services might be "drying up" (i.e., given the current trend in federal grants, the continuation of social service-oriented projects may be tenuous, at best). If grant monies are discontinued, then it might be reasonable to suggest that some personnel might be terminated (i.e., either turnovers will not be replaced or personnel will be immediately terminated). If that is the case, then the numbers in Table VI may be used to readjust the estimated total number of available positions in Table IV, by subtracting the number of personnel on grants from the total number of available positions; notice for Family Health Workers and Mental Health Workers, the number of available positions would decrease to below zero (i.e., an over surplus of personnel).

DISCUSSION OF RESULTS

Although not all the results of the interview schedule were presented, the results will be briefly discussed. The discussion of the results will assume the worst possible set of conditions for each occupational title (i.e., for purposes of providing training materials, it is more reasonable to have

TABLE VI

PROPORTION AND NUMBER OF PERSONNEL SUPPORTED BY GRANTS

TITLE	PROPORTION	NUMBER
Medical Secretary	.014	12
Mental Health Worker	.56	35
Family Health Worker	.79	29
Nursing Services Technician	0	0
Operating Room Technician	0	0

conservative estimates rather than overestimates). In addition, the discussion will make generalizations from the data which may not be completely warranted.

It would appear that the most feasible occupational title to provide training for in the City of Philadelphia would be Medical Secretaries. Twelve institutions reported having Medical Secretaries; there is an estimated gain of 56.8 positions for the 1972-1973 interval, and if the current turnover rate is representative of past and future turnover rates, then 228 individuals would be needed to replace those currently getting married and leaving the labor market. This results in 284.8 total available positions in 1972-1973. It is also worthwhile to note that the median starting salary ranks second from the lowest for the occupational titles for which data is available. Further, very few (only 12) individuals would be terminated if federal, state, local, or private granting would be discontinued. The factor having the most influence over the total number of available positions appears to be the turnover rate, if married women are economically encouraged to continue to work, then the turnover rate would decrease and thus the total number of available positions would also decrease. However, there is no reason (other than inflation and unemployed husbands) to speculate that the decrease in turnover rate would be significant. Another factor which might be important to consider is the fact that if institutions were to expand services, the expansion would include few additional Medical Secretaries. This may be an indication that the "growth" in the number of available positions may be stabilizing.

It would seem that females would be attracted to such training programs. In addition, the prospective student should realize that most institutions

require either a high school diploma or some special instruction to be considered employable. The prospective student should also realize that there does not appear to be any significant job mobility within the occupational family (if the reported reasons for turnover are accurate).

In the City of Philadelphia, the feasibility of providing training for Mental Health Workers and Family Health Workers is at best risky. Table II indicates that approximately 16 individuals will be needed to fill the upcoming available positions in both occupational titles. The question that needs to be answered is: Is it reasonable to provide training for an estimated demand of 16 people? (Recall that this also includes the number of turnovers). In addition, the prospective students should be aware of the following:

1. If grant monies "dry up", there may be few--if any--available positions. In addition, it seems reasonable to speculate that social services monies will be hard to come by.

2. The educational requirements for Mental Health Workers is primarily a high school diploma or equivalency, while the median average salary is near $7,000, (the range in salaries is negligible). While for Family Health Workers, the educational requirement is almost nonexistent in a majority of institutions, others require some college. The average starting salary is approximately $6,417, but the range in salaries is large ($3,200). This high range in salaries is due to the range in educational requirements (i.e., those institutions requiring more educational experience--some college--pay higher starting salaries).

3. The reason for turnovers in Family Health Workers is unspecified. (It may be an indication of "bad" working conditions.) While for Mental Health Workers, there is good reason to believe that there exists a useable job ladder or job lattice within the selected institutions.

4. If expansion occurs within the core institutions, Family Health Workers would probably not be drastically affected (i.e., few jobs would be created by such an expansion).

Males and females would be equally attracted to any training program for Mental Health Workers--in fact, the relatively high starting salary for Mental Health Workers might be due to the proportion of males currently holding this title (this is not to imply that the participating institutions are discriminating by sex). On the other hand, relatively few males would be interested in a training program for Family Health Workers.

Thus, it is questionable that if training materials were provided for these two occupational titles that prospective students would be willing to take the risks that are involved, (i.e., the major risk of social services money "drying up").

The available data for the Nursing Services Technician occupational title appears too unstable to make any firm statements about the feasibility of providing training materials. Any future in the Nursing Services Technician title is at this moment uncertain. The estimated decrease in personnel is approximately 10 people, yet the turnover rate is relatively high (23 percent, or 44 individuals). If all the turnovers stay in the Philadelphia area and take other Nursing Services Technician jobs in other institutions, there is a net gain of 34 people. (There is some indication this is happening--reason for turnover was reported to be primarily due to job mobility outside the institution.) For training purposes, it must be kept in mind that the 34 people needed represents only turnovers (i.e., the training would be only for replacement of those leaving either the title or the institution). It could be that

holders are leaving because they see no future in the title. The data can also be interpreted to mean that some institutions are not replacing their turnovers. If they find they can do without them, then there may be no future for a trained Nursing Services Technician. The issue is further clouded by the data which indicated that if the core institutions were to expand services, the Nursing Services Technician would be most affected (i.e., would expand the fastest). More realistically, the data may mean that some institutions are uncertain about the value of such personnel, while others are sure about their value and would hire "more" if any expansion were possible. If this is the case, it would make sense to adopt a wait-and-see attitude before committing oneself to providing training.

Otherwise, the Nursing Services Technician fairs "well" with an average starting salary around $6,556; its non-influence by grant money; and, required educational experience being specific vocational training. Such a training program would probably attract relatively more females than males. It may be presumed that the important question is: How many students would be attracted to such a training program, knowing that over the last two-year interval there has been a net loss of people employed?

The feasibility of providing training materials for prospective Operating Room Technicians is also questionable. Although the "growth" rate has been stable, it has been small--only about 2 percent, or approximately about 2.5 people per year. The turnover rate last year was 12 percent, or about 15 people. Thus, the estimated total number of positions available would be

17.5 people. The question here again arises: Is it worthwhile to develop a training program to meet a total demand of 17.5 individuals? The prospective trainee should be aware of:

1. the wide range in educational requirements for employment. One-third of the reporting institutions responded by indicating that they had no requirement, another one-third require a high school diploma or equivalency, one-quarter required specific vocational training, the remaining institutions reported other educational requirements. In addition, 25 percent of the institutions required past experience in some allied health profession.

2. the wide range in reported average starting salaries. This is due to the wide range of educational and past working experience. The median average starting salary reported was $6,110.

3. the unspecified reason for turnovers. All the involved institutions did not select one of the predetermined categories.

Relatively few males would be attracted to such a training program. No "outside" money is used to support personnel.

Thus, out of the five occupational titles for which data is present, the feasibility of providing training programs for Medical Secretaries is clear. While for Mental Health Workers, Family Health Workers, and Operating Room Technicians, the feasibility seems questionable. And, for Nursing Services Technicians, the data is too unstable and inconsistent to make any firm decisions.

CONCLUDING NOTES

This study and the results were presented for two reasons:

1. The data itself (without the discussion) might be of interest to community college officials and personnel; and,

2. To demonstrate that partial labor market studies are feasible, relatively inexpensive and meaningful.

The second comment may need additional explanation. The interview schedule used in this data collection indicated that personnel directors were not willing to speculate on the probability or consequences of any expansion or contraction (i.e., for such data to be used, it would be necessary to rephrase the data item). The data generated from such items would be useful in providing estimates of available positions in both "good" and "bad" times. It is also worthwhile to note that no personnel director used the category "perceived worker dissatisfaction" for the major reason for turnovers. It would appear that this item also needs additional work.